

WE CLAIM:

sub
a1
1. A genetic construct comprising a gene operatively-linked to a carrier, wherein the carrier is associated with a transmembrane form of viral glycoprotein or derivative thereof.

5 2. The genetic construct of Claim 1, wherein the transmembrane form of viral glycoprotein or derivative thereof is expressed on the surface of the carrier.

a
3. The genetic construct of Claim 1, wherein the transmembrane form of viral glycoprotein or derivative thereof is from Ebola.

4. The genetic construct of Claim 1, wherein the carrier is a viral vector.

10 5. The genetic construct of Claim 1, wherein the carrier is a non-biologic gene targeting vehicle.

6. The genetic construct of Claim 4, wherein the viral vector is a retroviral vector.

15 7. The genetic construct of Claim 4, wherein the viral vector is a lentiviral vector.

8. The genetic construct of Claim 5, wherein the non-biologic gene targeting vehicle is a liposome.

9. The genetic construct of Claim 5, wherein the non-biologic gene targeting vehicle is a DNA-protein complex.

20 sub
a2
10. A method of targeting a gene to a cell comprising the step of administering to a cell population a genetic construct comprising the gene operatively-linked to a carrier, wherein the carrier is associated with a transmembrane form of viral glycoprotein or derivatives thereof.

25 11. The method of Claim 10, wherein the transmembrane form of viral glycoprotein or derivative thereof is expressed on the surface of the carrier.

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- 16 -

12. The method of Claim 10, wherein the transmembrane form of viral glycoprotein or derivative thereof is from Ebola.

13. The method of Claim 10, wherein the carrier is a viral vector.

14. The method of Claim 10, wherein the step of administration is *ex vivo*.

5 15. The method of Claim 10, wherein the step of administration is *in vivo*.

16. The method of Claim 10, wherein the cell is an endothelial cell.

17. The method of Claim 10, wherein the cell is a hepatocyte.

18. The method of Claim 10, wherein the cell is a monocyte.

19. The method of Claim 10, wherein the cell is a dendritic cell.

10 20. The method of Claim 14, further comprising the step of introducing the cell population to a subject.

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09600766 054402

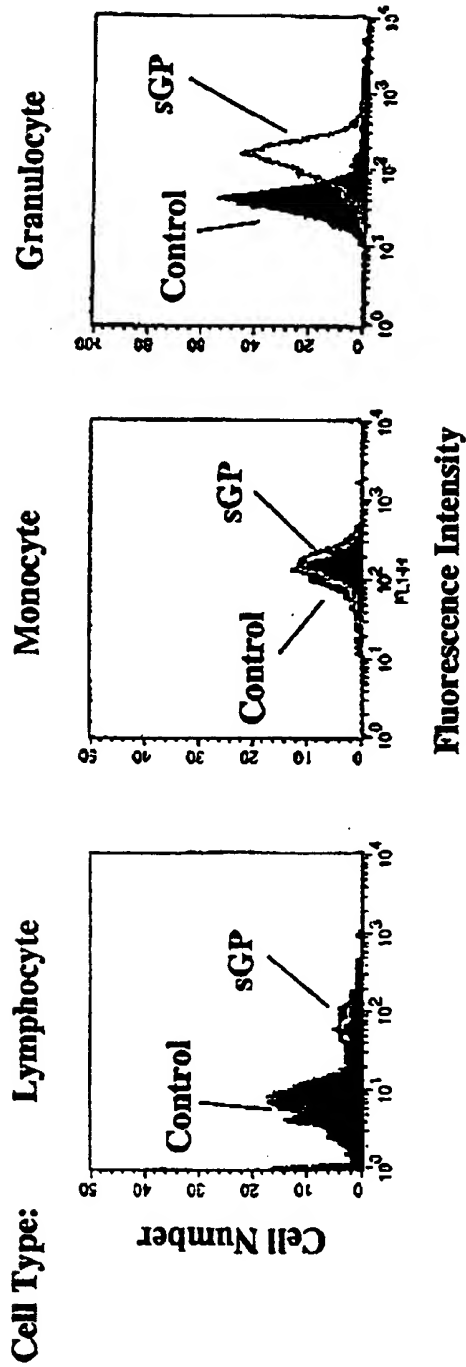


Figure 1A

Figure 1A1

Figure 1A2

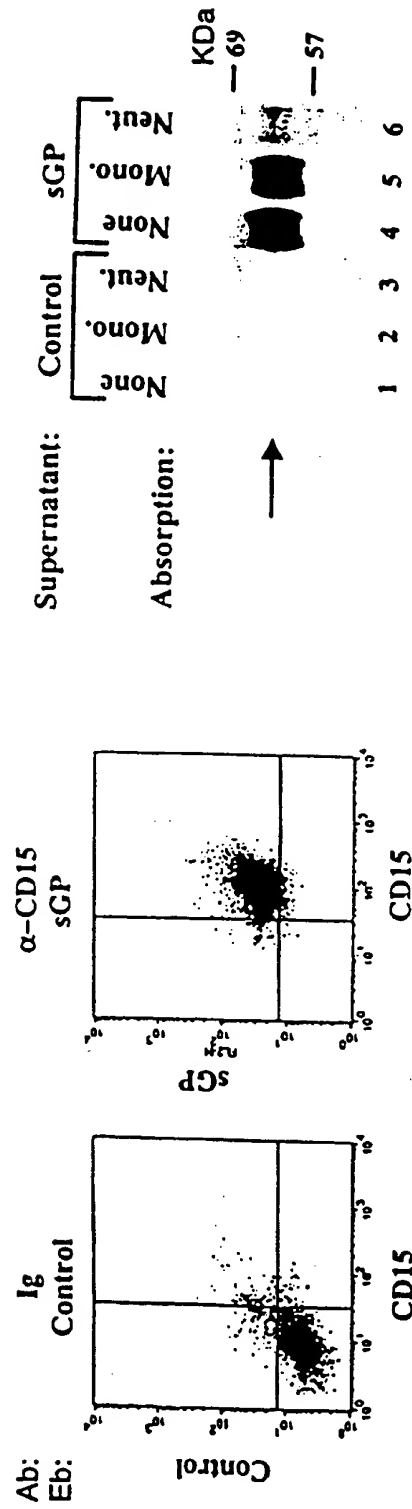


Figure 1B

Figure 1B1

Figure 1C

2/11

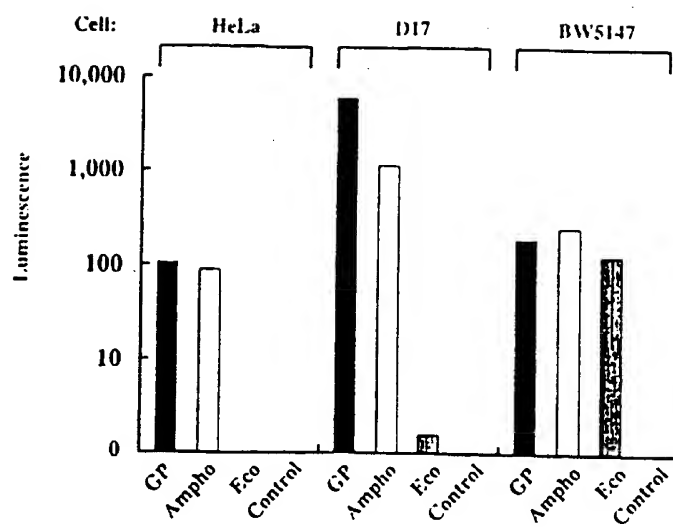


Figure 2A

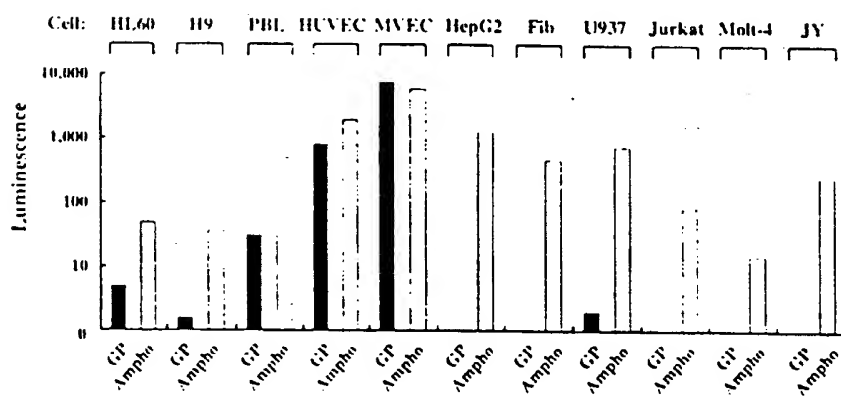


Figure 2B

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FIG. 2C

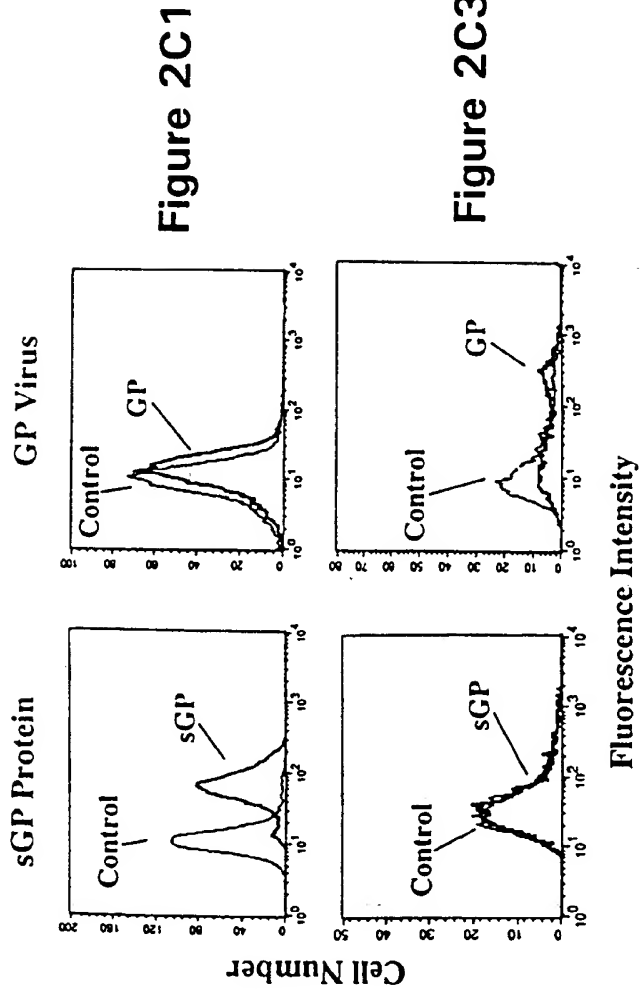


Figure 2C

Figure 2C2

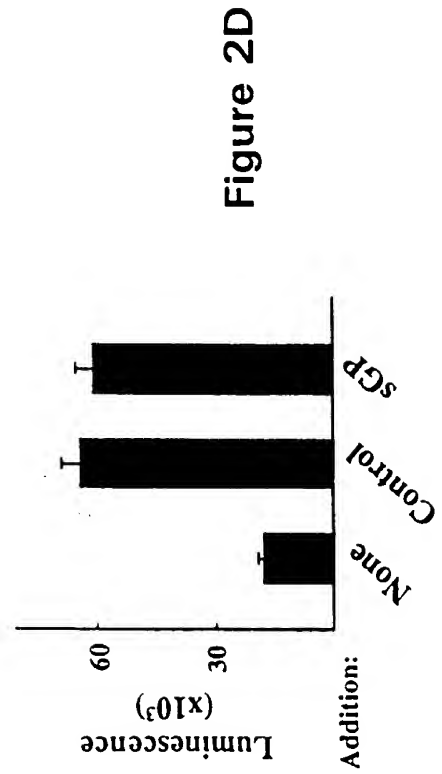


Figure 2D

Figure 3A

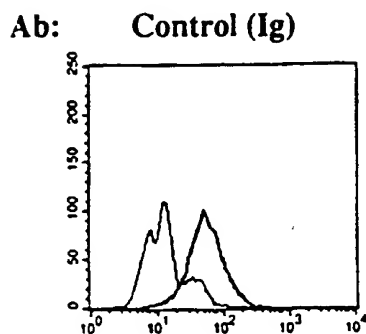


Figure 3B

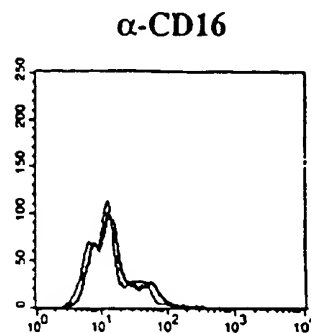


Figure 3C

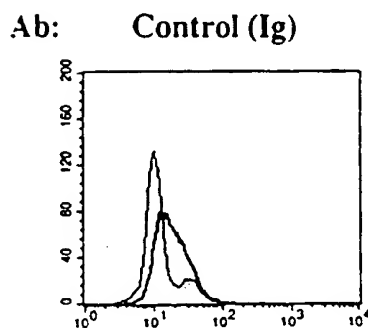


Figure 3D

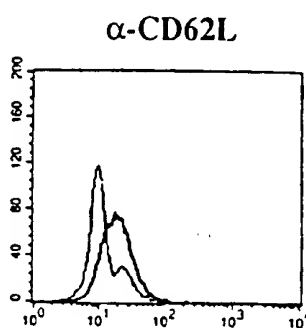


Figure 3E

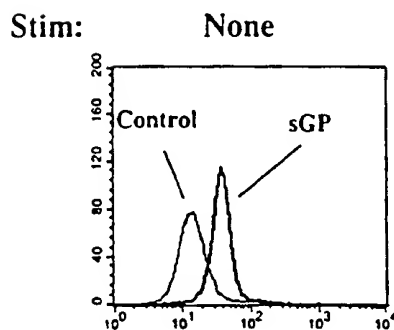
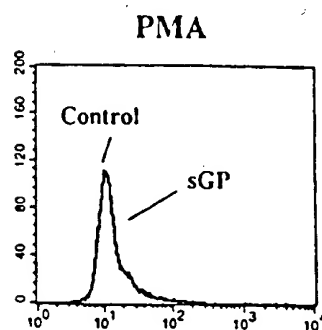


Figure 3F



Fluorescence Intensity

Cell Number

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5/11

Figure 4A

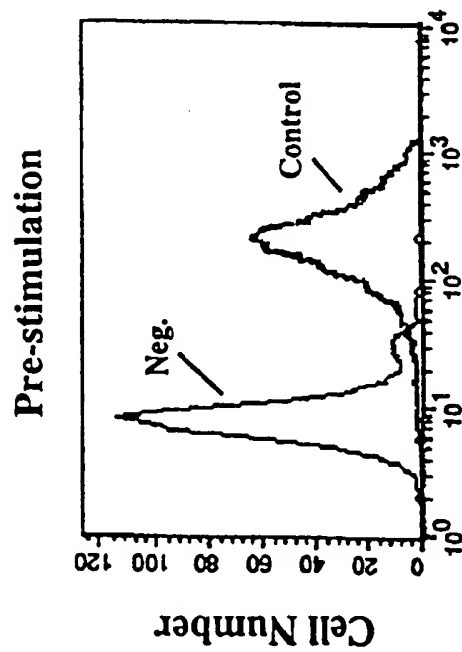


Figure 4B

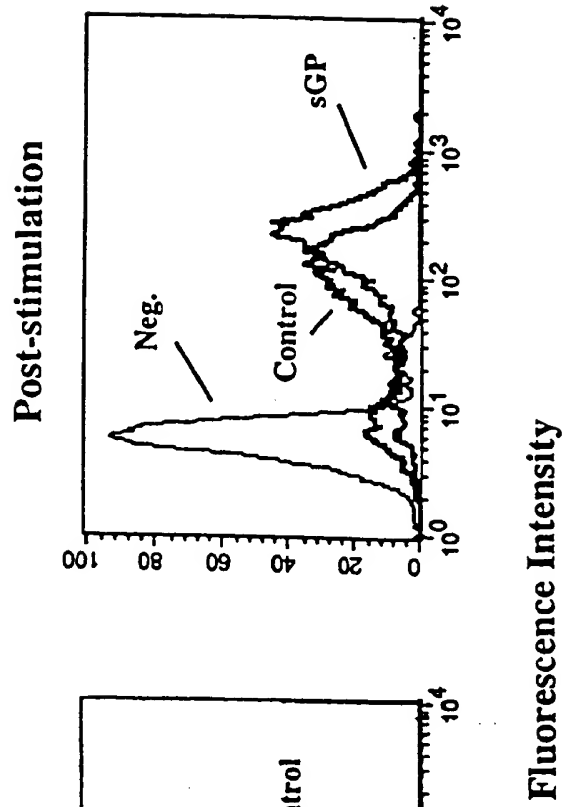


Figure 5A

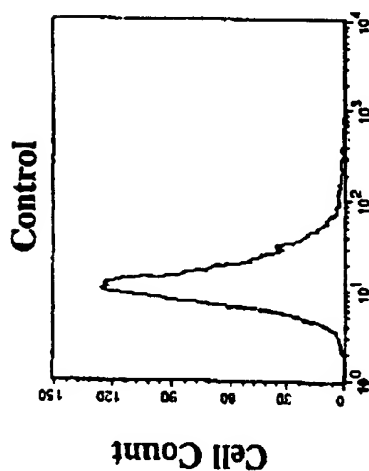


Figure 5B

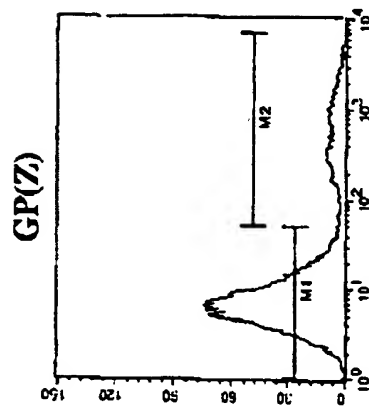
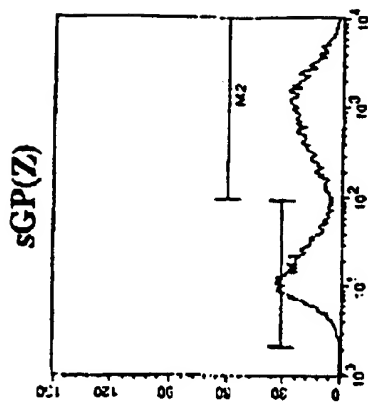


Figure 5C



7/11

FIG. 6

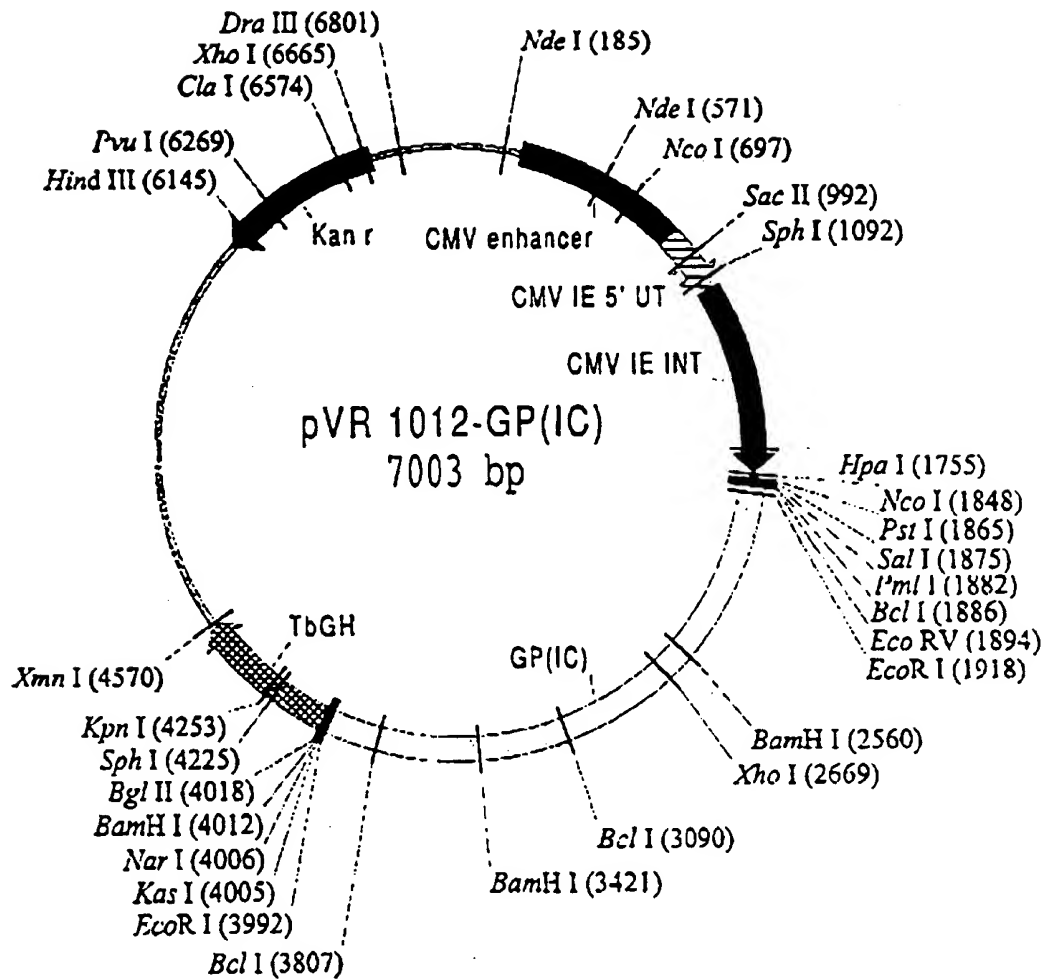


Figure 6

8/11

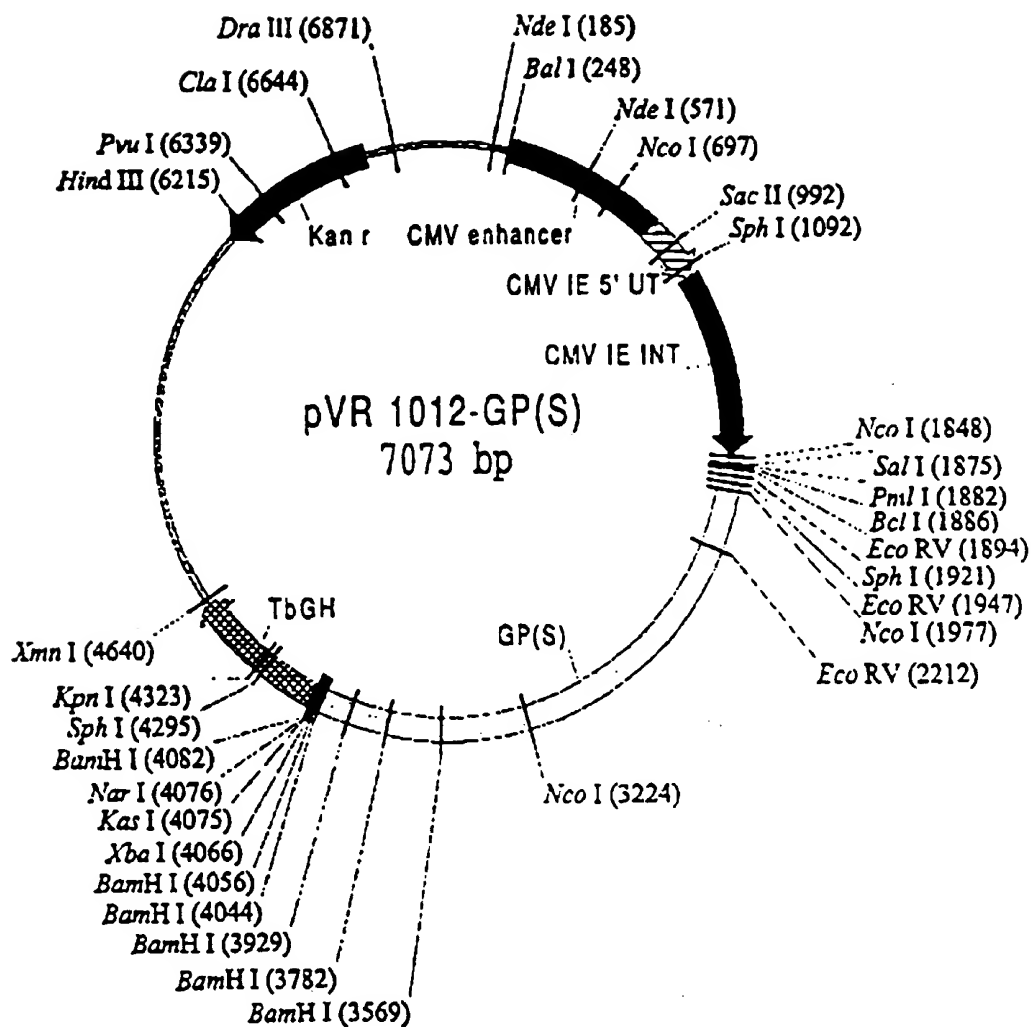


Figure 7

9/11

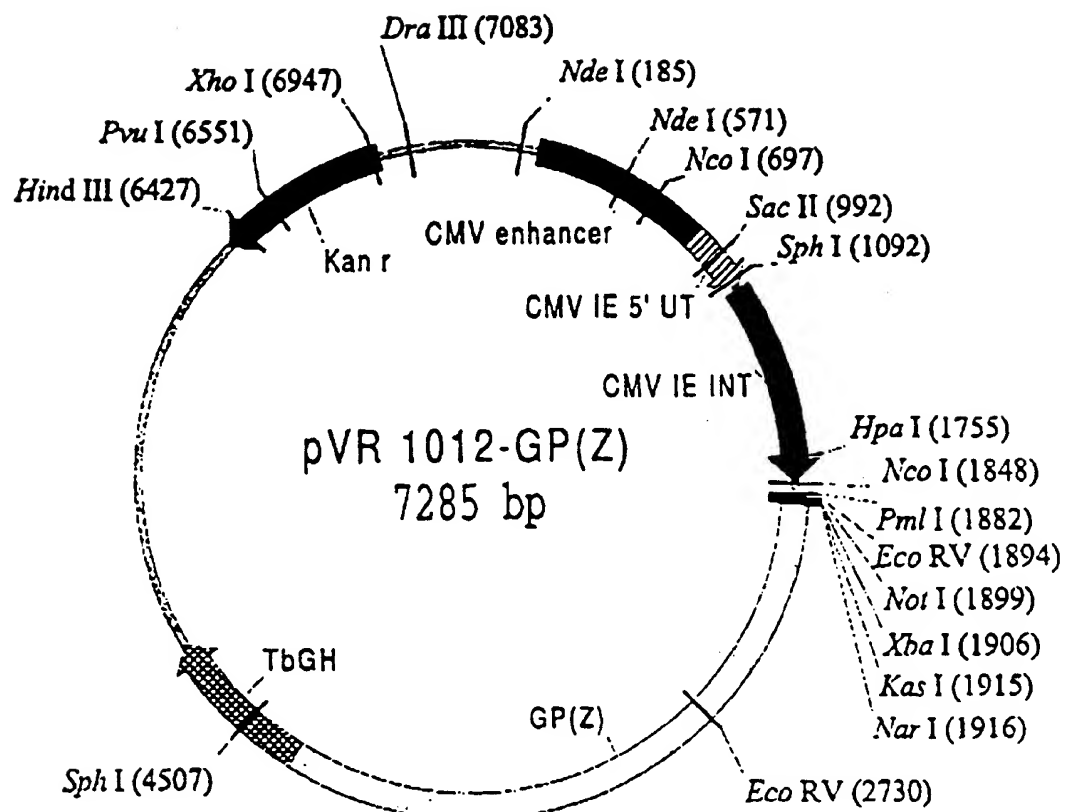


Figure 8

10/11

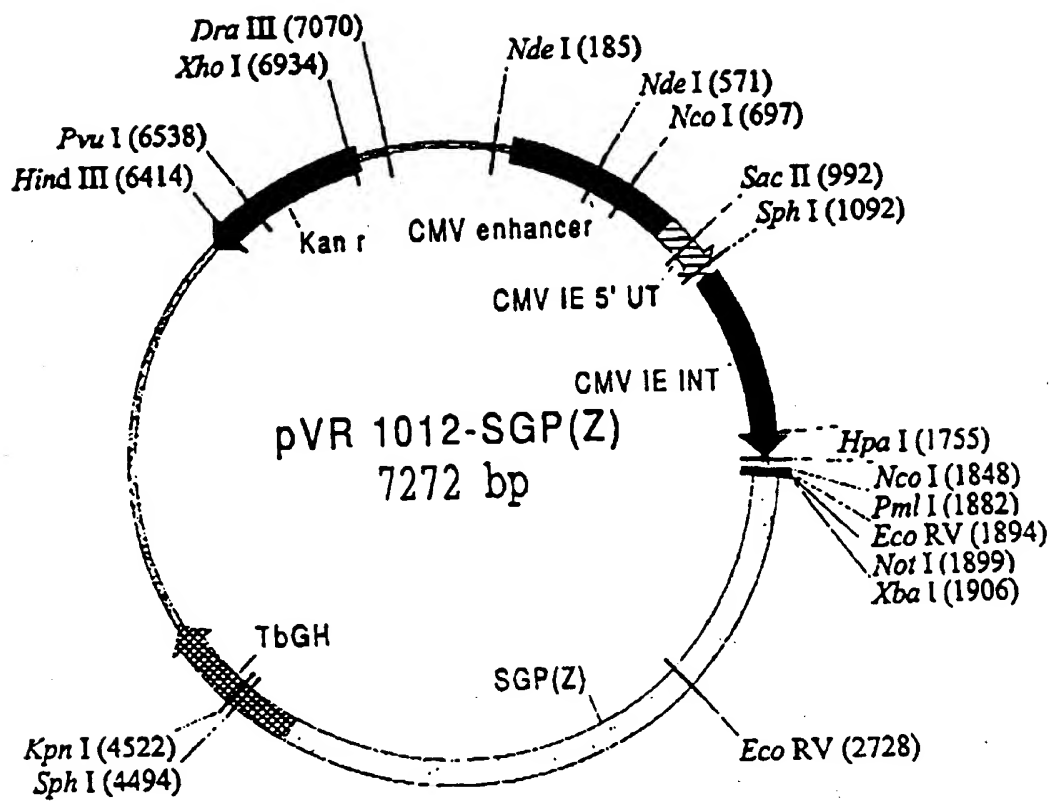


Figure 9

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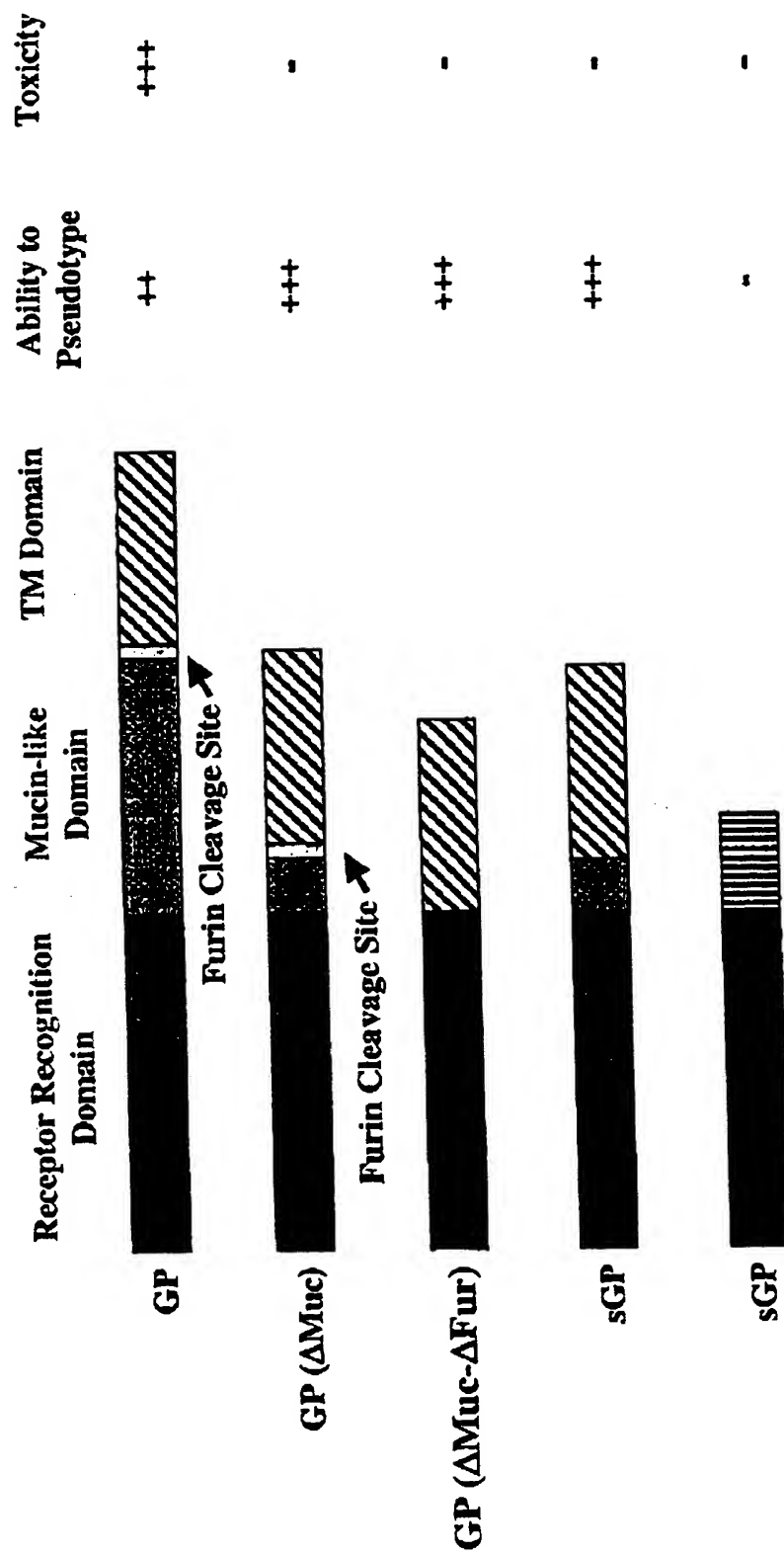


Figure 10

SEQUENCE LISTING ID NO: 1

pvr 1012-GP(IC)

General Description

DNA pvr 1012-GP(IC)
Local object
Created: 09/14/98 04:17PM
Last Modification Date: ? (no data)
length: 7003 bp
storage type: Basic
form: Circular

Comments

Restriction Map

BglII: 1 site AGATCT
TCTAGA

Clal: 1 site ATTCAT
TAGCTA

DraIII: 1 site CACNNNGTC
GTGNNNCAC

EcoRV: 1 site GATATC
CTATAG

HindIII: 1 site AAGCTT
TTCCAA

HpaI: 1 site GTTAAC
CAATTG

KasI: 1 site GGCGCC
CCGCGG

KpnI: 1 site GGTACC
CCATGG

NarI: 1 site GGCGCC
CCGCGG

PmlI: 1 site CAAGTG
GTGCAC

PstI: 1 site CTGCAG
GAGCTC

PvuI: 1 site CGATCG
GCTAGC

SacII: 1 site CCGCGG
GGCGCC

Sall: 1 site GTCGAC
CAGCTG

XmnI: 1 site GAANNNTTC
CTNNNNAAG

EcoRI: 2 sites GAATTC
CTTAAG

NcoI: 2 sites CCATGG
GGTACC

NdeI: 2 sites CATATG
GTATAC

SphI: 2 sites GCATGC
CGTACG

XhoI: 2 sites CTCGAG
GAGCTC

BamHI: 3 sites GGATCC
CCTAGG

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BclI: 3 sites TCATCA
 ACTAGT

Functional Map

CDS (4 signals)

CMV IE 5' UT

Start: 886 End: 1129

CMV IE INT

Start: 1130 End: 1840

TbGH

Start: 4020 End: 4572

Kan^r

Start: 6068 End: 6690 (Complementary)

Misc_feature (2 signals)

CMV enhancer

Start: 248 End: 885

GP(IC)

Start: 1870 End: 4019

Annotations

09600766-051401
TbGH

1 TCGCGCGTTT CGGTGATGAC GGTGAAAACC TCTGACACAT GCAGCTCCCG
AGCGCGCAAA GCCACTACTG CCACITTTGG AGACTGTGTA CGTCGAGGGC

51 GAGACGOTCA CAGCTTGTCT GTAAGCGGAT GCCGGGAGCA GACAGCCCCG
CTCTGCCAGT GTCGAACAGA CATTGCGCTA CGGCCCTCGT CTGTTGCGGC

101 TCAGGCGCGC TCAGCGGGTG TTGGCGGGTG TCGGGGCTGG CTTAACTATG
AGTCCGCGCG AGTCGCCAC AACCGCCAC AGCCCGGACC GAATTGATAC

NdeI

151 CGGCATCAGA GCAGATTCTA CTGAGAGTCC ACCATATCCG GTGTCAAATA
GCCGTAGTCT CTTCTAACAT GACTCTCAGG TGGTATACCG CACACTTTAT

201 CCGCACAGAT CGCTAAGGAG AAAATACCGC ATCAGATTGG CTATTGGCCA
GGCGTGCTTA CGCATTCTC TTTTATGGCG TAGTCTAACG GATAACCGGT

251 TTGCATACGT TGTATCCATA TCATAATATG TACATTTATA TTGGCTCATG
AACGTATGCA ACATAGGTAT AGTATTATAC ATGTAAATAT AACCGAGTAC

301 TCCACATTA CCGCCATGTT GACATTGATT ATTGACTAGT TATTAATAGT
AGGTTGTAAT GCGCGTACAA CTGTAACTAA TAAGTGATCA ATAATTATCA

351 AATCAATTAC GGGGTCAATTA GTTCATAGCC CATATAAGGA GTTCCGCGTT
TTAGTTAATG CCCCAGTAAT CAAGTATCGG GTATATACCT CAAGGCCCAA

401 ACATAACTTA CGGTAATGG CCGCGCTGGC TGACCGCCCA ACGACCCCGG
TGTATTGAAT GCCATTTACC GGGCGGACCG ACTGGCGGGT TGCTGGCGGC

451 CCCATTGACG TCAATAATGA CGTATGTTCC CATAGTAACG CCAATAGGGA
GGGTAACTGC AGTTATTACT GCATACAAGG GTATCATTCG GGTATCCCT

501 CTTTCCATTG ACGTCAATGG GTGGAGTATT TACGGTAAAC TGCCCACTGG
GAAAGGTAAC TGCAGTTACC CACCTCATAA ATGCCATTG ACGGGTGAAC

NdeI

551 GCAGTACATC AAGTGATCA TATGCCAAGT ACGCCCCCTA TTGACGTCAA
CGTCATGTAG TTCACATAGT ATACGGTTCA TCGGGGGGAT AACTGCAGTT

601 TGACGGTAAA TGGCCCCGCT GGCATTATGC CCAGTACATG ACCTTATGGG
ACTGCCATTT ACCGGCCGGA CCGTAATAGG GGTCAATGTAC TGGAAATACCC

NcoI

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NcoI

701 GTGATGCGGT TTGGCAGTA CATCAATGGG CGTGGATAGC GGTTCGACTC
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TGGCCCTAAA GGTTCAGAGG TGGCGTAACT GCAGTTACCC TCAAAACAAA

801 GGCACCAAAA TCAACGGGAC TTTCCAAAAT GTCGTAACAA CTCGGCCCCA
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0314031 09200960

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AACTGCGTTT ACCCGCCATC CGCACATGCC ACCCTCCAGA TATATTCGTC

901 AGCTCGTTTA GTGAACCGTC AGATCGCCTG GAGACCCAT CCACGCTGTT
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SacII

951 TTGACCTCCA TAGAAGACAC CGGACCCGAT CCAGCCTCCG CGGCGCGGAA
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SphI

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1101 TTTTGGCTTG GGGCCTATAC ACCCCCGCTT CCTTATGCTA TAGGTGATGG
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1201 TATTGGTGAC CACTCTTTC ATTACTAATC CATAACATGG CTCTTTGCCA
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1251 CAACTATCTC TATTGGCTAT ATGCCAATAC TCTGTCTTC AGAGACTGAC
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RpaI

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NcoI

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SalI

NcoI PstI PmlI BclI EcoRV
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EcoRI

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BamII

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XhoI

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BclI

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BamHI

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BclI

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 CTTATCCTTA GTGTCTCAT TAGTAACGAT AATAACGAAA CGACACGTAA

EcoRI

3951 TGCAAAATCA TGCTTTGAAC TAATATAGCA TCATACTTTA GAATTCATGA
 ACGTTTAACT ACGAAACTTG ATTATATCGT AGTATGAAAT CTTAAGATCT

NarIXbaIBamHI BglII

4001 CCAGCCGCOCT GGATCCAGAT CTGCTGTGCC TTCTAGTTGC CAGCCACTG
 GGTCCGCGGA CCTAGGTCTA GACGACACGG AAGATCAACG GTCGGTAGAC

 4051 TTGTTTGCCC CTCCCCCGTG CCTTCCTTGA CCTGGGAAGG TGCCACTCCC
 AACAAACGGG GAGGGGGCAC GGAACGAAC GGGACCTTCC ACCGTGAGGG

 4101 ACTGTCTCTT CCTAATAAAA TGAGGAAATT GCATCCGATT GTCTGAATAG
 TCACAGGAAA GGATTATTTT ACTCCTTTAA CGTAGCGTAA CAGACTCATC

 4151 GTGTCAATCT ATTCTGGGGG GTGGGCTCGG GCAGCACAGC AAGGGGGAGG
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SphI

4201 ATTCGGAAGA CAATAGCAGG CATGCTGGGG ATGCGGTGGG CTCTATGGGT
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KpnI

4251 ACCCAGGTGC TGAAGAATTG ACCCGGTTCC TCCTGGGCCA GAAACAAGCA
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4301 GGCACATCCC CTTCTCTGTG ACACACCCCTG TCCAGCCCCC TGGTCTTTAG
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4351 TCCAGCCCCC ACTCATAGGA CACTCATAGC TCAGGAGCCC TCCGCCTTCA
AAGGTCCGGG TGAGTATCCT CTGAGTATCG AGTCCCTCCC AGGCGGAAGT

4401 ATCCACCCCG CTAAAGTACT TGGAGCGGTC TCTCCCTCCC TCATCAGCCC
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4451 ACCAAACCAA ACCTAGCCCTC CAAGAGTGGG AAGAAATTAA ACCAAGATAG
TGGTTGGGT TGATTCGGAG GTCTCACCC TTCTTTAATT TCGTCTATC

4501 GCTATTAAGT GCAGAGCGAG AGAAATGCC TCCAACATGT GAGGAAGTAA
CGATTAATCA CGTCTCCCTC TCTTTTACGG AGGTTGTACA CTCCTTCATT

XbaI

4551 TGAGAGAAAT CATAGAAATT CTTCGCCCTC CTCGCTCACT GACTCGCTGC
ACTCTCTTTA GTATCTTAA CAAGGCCAAG GAGCCAGTGA CTGAGCGACG

4601 CCTCGGTGCT TCGGCTGCGG CGAGCGGTAT CAGCTCACTC AAAGCCGGTA
CGAGCCAGCA AGCCGACGCC CCTCGCCATA GTGAGTGAG TTTCCGCAT

4651 ATACGGTTAT CCACAGAATC AGGGGATAAC GCAGGAAAGA ACATGTGACC
TATGCCAATA GGTGTCTTAG TCCCTACTG CGTCTTTCT TGTACACTCG

4701 AAAAGGCCAG CAAAAGGCCA GGAACCGTAA AAAGCCCGCG TTGCTGCCGT
TTTTCCGGTC GTTTCCGGT CTTTGGCATT TTCCGGCGC AACGACCGCA

4751 TTTTCATAG GTCGCCGCC CCTCAGGAGC ATCACAATAA TCGACGCTCA
AAAAGGTATC CGAGGCGGGG GGACTGCTCG TAGTGTTTT AGCTCGAGT

4801 AGTCAGAGGT GCGGAAACCC GACAGGACTA TAAAGATACC AGGCGTTTCC
TCAGTCTCCA CCGCTTTGGG CTGTCTGAT ATTTCTATGG TCCGCAAGG

4851 CCCTGGAAGC TCCCTCGTGC CTTCTCTGT TCCGACCTTG CCGCTTACCG
GGGACCTTCG AGGGAGCACG CGAGACGACA AGGCTGGGAC GGCGAATGCC

4901 GATACCTGTC CCGCTTTCTC CTTTCGGGAA GCGTGGCGCT TTCTCAATGC
CTATGCACAG GCGGAAAGAG GGAAGCCCTT GGCACCGCA AAGAATTAGC

4951 TCACGCTGTA GGTATCTCAG TTGGGTGTAG GTCGTTGCT CCAAGCTGGG
AGTGGACAT CCATAGAGTC AAGCCACATC CAGCAAGCGA GGTTCGACCC

5001 CTGTCTCCAC GAACCCCCCG TTACGCCGA CCGCTGCCCG TTATCCGGTA
GACACACGTG CTTGGGGGGC AAGTCGGGCT GCGGACGCGG AATAGGCCAT

09600766-051401

5051 ACTATCGTCT TGAATCCAAAC CCGGTAAGAC ACGACTTATC GCCACTGGCA
 TGATAGCAGA ACTCAGGTTG GGCCATTCTG TGCTGAATAG CGGTGACCGT

 5101 GCACCCACTG GTAACAGGAT TAGCAGACCG AGGTATGTAG GCGGTGCTAC
 CCTCGGTGAC CATGTGCTCA ATCGTCTCGC TCCATACATC CGCCACGATG

 5151 AGACTTCTTG AACTGGTGGC CTAACACGG CTACACTAGA AGGACAGTAT
 TCTCAAGAAC TTCACCACCG GATTGATGCC GATGTGATCT TCCTGTCATA

 5201 TTGGTATCTG CGCTCTGCTG AAGCCAGTTA CCTTCGGAAA AAGAGTTGOT
 AACCATAGAC GCGACACGAC TTCGGTCAAT GGAAGCCTTT TTCTCAACCA

 5251 AGCTCTTGAT CCGGCAAAACA AACCAACCGT GGTAGCGGTG GTTTTTTTGT
 TCGAAGACTA GCGCGTTGT TTGGTGGCGA CCATCGCCAC CAAAAAACA

 5301 TTCCAGCAG CAGATTACGC GCAGAAAAA AGGATCTCAA GAAGATCCTT
 AACGTTCTGC GTCTAATCGG CGTCTTTTTC TCCTAGAGTT CTTCAGGAA

 5351 TCACTTTTTC TACGGGGTCT GACGCTCAGT GGAACGAAAA CTCACGTAA
 ACTAGAAAAAC ATGCCCCAGA CTGCGAGTCA CCTTGCTTTT GAGTGCAATT

 5401 GGGATTTTGG TCATCAGATT ATCAAAAAGG ATCTTCACCT AGATCCTTTT
 CCTAAAAAC AGTACTCTAA TAGTTTTTCC TAGAAGTGGT TCTAGGAAA

 5451 AAAATAAAAA TGAAGTTTTA AATCAATCTA AAGTATATAT GAGTAAACTT
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 5501 GGTCTGACAC TTACCAATGC TTAATCAGTG AGGCACCTAT CTCAGCGATC
 CCAGACTCTC AATGGTTACG AATTAGTCAC TCCGTGGATA GACTCGCTAG

 5551 TGTCTATTTC GTTCATCCAT AGTTGCCTGA CTCCGGGGGG GGGGGCCGCT
 ACPGATAAAG CAAGTAGGTA TCAACGGACT GAGGCCCCCC CCCCCCGCGA

 5601 GAGGTCTGCC TCGTGAAGAA GGTGTTGCTG ACTCATACCA GCGCTGAATC
 CTCAGACCGG ACCACTTCTT CCACAACGAC TGAGTATGGT CCGGACTTAG

 5651 GCGCCATCAT CCAGCCAGAA AGTGAGGGAG CCACCGTTGA TGAGAGCTTT
 CGGGGTAGTA GGTGCGTCTT TCACTCCCTC GGTGCCAAT ACTCTCGAAA

 5701 GTTGTACGTG GACCAGTTGG TGATTTTGAA CTTTTGCTTT GCCACGGAAC
 CAACATCCAC CTGGTCAACC ACTAAAATT GAAAACGAAA CGGTGCTTG

 5751 GGTCTCCGTT GTCGGGAAGA TCGGTGATCT GATCCCTCAA CTCAGCAAAA
 CCAGACGCAA CAGCCCTTCT ACGCACTAGA CTAGGAAGTT GAGTCGTTTT

 5801 GTTCGATTTA TTCAACAAAG CCGCCGTCCC CTCAGTCAG CGTAATGCTC
 CAACCTAAAT AAGTTGTTTC GCGCCAGGG CAGTTCAGTC GCATTACGAG

 5851 TGCCAGTGT ACAAACAATT AACCAATTCT GATTAGAAAA ACTCATCCAG
 ACGGTCACAA TGTTCGTTAA TTGGTTAAGA CTAATCTTTT TGAGTAGCTC

 5901 CATCAATGA AACTGCAATT TATTCATATC AGGATTATCA ATACCATATT
 GTAGTTTACT TTGACGTAA ATAAGTATAG TCCTAATAGT TATGCTATAA

 5951 TTTGAAAAAG CCGTTTCTGT AATGAAGGAG AAAACTCACC GAGGCAGTTC
 AAACCTTTTC GGCAGAGACA TTACTTCTC TTTTGAGTGG CTCGCTCAG

6051 ATCAATACAA CCTATTAA TT TCCCTCGTC AAAATAAGG TTATCAAGTC
TAGTATGTT GGATAATTAA AGGGGAGCAG TTTTATTCC AATAGTTAC

6101 AGAATCACC ATGAGTGACG ACTCAATCCG GTGAGATTCG CAAAGCTTA
TCTTAGTGG TACTCACTCC TGACTTAGCC CACTCTTACC GTTTTCGAAT

6201 AAATCACTC GCATCAACA AACCGTTATT CATTGGTGAT TGCGCCTGAG
TTTATGTGAG CGTAGTTGGT TTGGCAATAA GTAAGCACTA ACCGGGACTC

6251 CCAGACGAAA TACGCGATCG CTGTTAAAAG GACAATTACA AACAGGAATC
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6351 TGRATCAGGA TATTCTTCTA ATACCTGGAA TGCTGTTTC CCGGGGATCG
ACTTATCTCT ATAAGAAGAT TATGGACCTT ACGACAAAG GGCCCTAGC

6451 GTCCGAAGAG GCATAAATTC CGTCAGCCAG TTTAGTCTGA CCATCTCATC
CAGGCTCTTC CGTAATTAAAG GCAGTCGGTC AATTCAGACT GGTAGAGTAG

6501 TGTAACTCA TTGGCAACGC TACCTTTGCC ATGTTTCAGA ACAACTCTG
ACATTCTAGT AACCGTTGCG ATGGAACCGG TACAAAGTCT TTGTTGAGAC

6551 GCGCATCGGG CTTCCCATAC AATCGATAGA TTGTCCGACC TGATTGCCCG
CCGTTAGCCC GAAGGGTATC TTAGCTATCT AACAGCGTGG ACTAACGGGC

6501 ACATTATCGC GAGCCCATTT ATACCCATAT AATCAGCAT CCATGTTGGA
TGTAAATAGCG CTCGGGTAAA TATCGGTATA TTTAGTCGTA GGTACAACCT

6651 ATTTAATCGC GGCCTCGAGC AAGACGTTTC CCGTTGAATA TGGCTCATAA
TAAATTACCG CCGGAGCTCG TTCTGCAAG GGCAACTTAT ACCGAGTATT

6781 CACCCCTGT ATTACTGTT ATGTAACCAG ACAGTTTAT TGTTCATGAT
GTGGGAACA TAATGACAA TACATTGCTC TGTCAATA ACAAGTACTA

6751 GATATATTTT TATCTTGTGC AATGTAACAT CAGAGATTTT GAGACACAC
CTATATAAA ATAGACACG TTACATTGTA GTCTCTAAA CTCTCTCTG

D=III

6801 GTGGCTTTC CCCCCCCCC ATTATTGAAG CATTATCAG GGTTATTGTC
CACCGAAAGC CCGGGGGGGG TAATAACTTC GTAAATAGTC CCAATAACAG

6851 TCATGAGCCG ATACATATTT GAATGTATTT AGAAAAATAA ACAATAGCG
AGTACTCGCC TATGTATAAA CTEACATAAA TCTTTTATT TGTTTATGCC

6901 GTCCGCGCA CATTTCCTCCG AAAAGTCCCA CCTGACGTCT AAGAAACCAT
CAAGGCGCGT GTAAAGGGGC TTTTCACGGT GCACTCCACA TTCTTTGGTA

6951 TACTATCATG ACATTAACTT ATAAAAATAG GCGTATCAG AGCCCTTTTC
ATAATAGTAC TGTAAATTGA TATTTTATC CCGATAGTCC TCCGGGAAG

7001 GTC
CAG

09500766-051401

pVR 1012-G2(S)

General Description

DNA pVR 1012-GP(S)
 Local object
 Created: 09/14/98 03:58PM
 Last Modification Date: ? (no data)
 length: 7073 bp
 storage type: Basic
 form: Circular

Comments

Restriction Map

Ball: 1 site TGGCCA
 ACCGGT
 BclI: 1 site TCATCA
 ACTAGT
 ClaI: 1 site ATTCGAT
 TAGCTA
 DraIII: 1 site CACGCGTG
 GTGCGGTCAC
 HindIII: 1 site AAGCTT
 TTCGAA
 Kasi: 1 site GCGGCC
 CCGCGG
 KpnI: 1 site GGTACC
 CCATGG
 NarI: 1 site GCGGCC
 CCCTCGG
 PmlI: 1 site CACGTG
 GTGCGAC
 PvuI: 1 site CGATCG
 GGTAGC
 SacI: 1 site CCGCGG
 GCGGCC
 Sall: 1 site GTCGAC
 CXGCTG
 XbaI: 1 site TCTAGA
 AGATCG
 XmnI: 1 site GAAATGATTC
 CTTTGGGAAAG
 NdeI: 2 sites CATATG
 GTATAC
 EcoRV: 3 sites GATATC
 CTATAG
 SphI: 3 sites GCATGC
 CGTACG
 NcoI: 4 sites CCATGG
 GGTACG
 BamHI: 6 sites GGATCC
 CCTAGG

Functional Map

CDS (4 signals)

CMV IE 5' UT

09600766-051401

start: 886 End: 1129

CMV IE INT

start: 1130 End: 1840

TbGH

start: 4090 End: 4642

Kan r

start: 6138 End: 6760 (Complementary)

Misc_feature (2 signals)

CMV enhancer

start: 248 End: 885

GP(S)

start: 1870 End: 4089

Annotations

09600766 054401
TbGH

1 TCCGCGGTTT CCGTGATGAC GGTGAAAACC TCTGACACAT GCAGCTCCCG
 AGCGGCCAAA GCCACTACTG CCACCTTTGG AGACTGTGTA CGTCGAGGGC

 51 GAGACGGTCA CAGCTTGTCT GTAAGCGGAT GCCGGGAGCA GACAAGCCCC
 CCGCGCACT GTCGAACAGA CATTGCGCTA CGGCCCTCGT CTGTTGGGGC

 101 TCAGGCCCCG TCAGCGGGTG TTGCGGGGTG TCGGGGCTGG CTTAACTATG
 AGTCGCGCGC AGTCGCCCCA AACCGCCCCA AGCCCCGACC GAATTGATAC

NdeI

151 CGGCATCASA GCAGATTCTA CTGAGACTGC ACCATATGCG GTGTCAATA
 CCGGTACTCT CGTCTAACAT GACTCTCAGG TGGTATACCG CACACTTTAT

BalI

201 CCGCACAGAT GCGTAAGGAG AAAATACCGC ATCAGATTGG CTATTGGCCA
 GCGGTGTCTA CGCATTCCCTC TTTATGGCG TAGTCTAACG GATAACCGGT

 251 TTGCATACGT TGTATCCATA TCATAATATG TACATTATA TTGGCTCATG
 AACGTATGCA ACATAGGTAT AGTATTATAC ATGTAAATAT AACCGAGTAC

 301 TCCACATTAA CCGCCATGTT GACATTGATT ATTGACTACT TATTAATAGT
 AGGTGTGAAT GCGCGTACAA CTGTAACATA TAACGTATCA ATAATTATCA

 351 AATCAATTAC GGGGTCATTA GTTCATAGCC CATATATGGA GTTCCGGGTT
 TTAGTTAATG CCCCAGTAAT CAAGTATCGG GTATATACCT CAAGGCGCAA

 401 ACAATACTTA CGGTAATGG CCGCCCTGGC TGACCGCCCA ACCACCCCGG
 TGTATTGAAT GCCATTACG GGGCGGACCG ACTGGCGGGT TGCTGGGGGC

 451 CCCATTACG TCAATAATGA CGTATGTTCC CATAGTAACG CCAATAGGGA
 GGGTAAGTGC AGTTATTACT GCATACAAGG GTATCATTGC GGTATCCCT

 501 CTTTCCATTG ACGTCAATGG GTGGAGTATT TACGGTAAAC TGCCCACTTG
 GAAAGCTAAC TCCAGTTACC CACCTCATAA ATGCCATTG ACGGCTGAAC

NdeI

551 GCAGTACATC AAGTGTATCA TATGCCAAGT ACGCCCCCTA TTGACGTCAA
 CGTCATGTAG TTCACATAGT ATACGGTTCA TGGCGGGGAT AACTGCAGTT

 601 TGACGGTAAA TGGCCCCGCT GGCATTATGC CCAGTACATG ACCTTATGGG
 ACTGCCATTI ACCGGGCGGA CCGTAATACG GGTCACTGAC TGGAAATACC

NcoI

651 ACTTCCTAC TTGGCAGTAC ATCTACGTAT TAGTCATCGC TATTACCATG
 TGAAGCATG AACGCTCATG TAGATGCATA ATCAGTAGCG ATAATGGTAC

NcoI

701 GTGATCGGGT TTTGGCAGTA CATCAATGGG CGTGGATACC GGTTCGACTC
 CACTACGCCA AAACCGTCAT GTAGTTACCC GCACCTATCG CCAAACGTAG

 751 ACGGGGATTT CCAAGTCTCC ACCCCATTGA CGTCAATGGG AGTTTGTTTT
 TGCCCTTAAA CGTTCAGAGG TGGGGTAACT GCAGTTACCC TCAACAAAA

09600766-05401

801 GGCACCAAAA TCAACGGGAC TTTCACAAAT GTCGTAACAA CTCCGCCCCA
CCGTGGGTTT AGTTGGCCCTG AAAGGTTTTA CAGCATTGTT GAGGCGGGGT

851 TTGACCAAAA TGGGCGGTAG CCGTGTACGG TGGGAGGTCT ATATAAGCAG
AACTGGGTTT ACCCGCCATC CGCACATGCC ACCCTCCAGA TATATTGGTC

901 AGCTCGTTTA GTGAACCGTC AGATCGCCTG GAGACGCCAT CCACGCTGTT
TCGAGCAAT CACTTGGCAG TCTAGCGGAC CTCTCCGGTA GGTCCGACAA

SacII

951 TTGACCTCCA TAGAAGACAC CGGACCCGAT CCAGCCTCCG CGGCGGGGAA
AACTGGAGGT ATCTTCTGTG GCCCTGGCTA GGTCCGAGGC GCGGCGCCTT

1001 CGGTGCATTG GAACGCGGAT TCCCCGTGCC AAGAGTGACG TAAGTACCGC
GCCACGTAAC CTTGCGCCTA AGGGGCACGG TTCTCACTGC ATTCATGCGG

SphI

1051 CTATAGACTC TATAGGCACA CCCCTTTGGC TCTTATGCAT GCTATACTGT
CATATCTGAG ATATCCGTGT GGGGAAACCG AGAATACGTA CGATATGACA

1101 TTTTGGCTTG GGGCCTATAC ACCCCCGCTT CCTTATGCTA TAGGTGATGG
AAAACCGAAC CCCGGATATG TGGGGCCGAA GGAATACGAT ATCCACTACC

1151 TATAGCTTAG CCTATAGGTG TGGGTTATTG ACCATTATTG ACCACTCCCC
ATATCGAATC GGATATCCAC ACCCAATAAC TGGTAATAAC TGGTGAGGGG

1201 TATTGGTGAC GATACCTTC ATTAATAATC CATAACATGG CTCCTTGCCA
ATAACCACTC CTATGAAAGG TAATGATTAG GTATTGTACC GAGAAACGGT

1251 CAACATATTC TATTGGCTAT ATGCCAATAC TCTGTCTTTC AGAGACTGAC
GTTGATAGAG ATAACCGATA TACCGTTATG AGACAGGAAG TCTCTGACTG

1301 ACCGACTCTG TATTTTACA GGATGGGGTC CCACTTATTA TTTCACAAAT
TGCCTGACAC ATAAATAATG CCGACCCGAG GGTAAATAAT AAATGTTTAA

1351 CACATATACA ACAACGGCGT CCCCCGTGCC CGCACTTTT ATTAAACATA
GTGTATATGT TGTGCGGCA GGGGGCACGG CGGTCAAAA TAATTGTAT

1401 CCGTGGGATC TCCACCGGAA TCTCGGGTAC GTGTCCGGA CATGGGCTCT
CGCACCCTAG AGGTGCGCTT AGAGCCCATC CACAAGGCCT GTACCCGAGA

1451 TCTCCGGTAG CGGCGGAGCT TCCACATCCG AGCCCTGGTC CCATGCCCTC
AGAGCCCATC GCGGCTCGA AGGTGTAGGC TCGGGACCAG GGTACGGAGG

1501 AGCGGCTCAT GGTGCTCGG CAGCTCCTTG CTCCTAACAG TGGAGGCCAG
TCGCCGAGTA CCAGCGAGCC CTCGAGGAAC GAGGATTGTC ACCTCCGGTC

1551 ACTTAGGCAC AGCACAATCC CCACCACCAC CAGTGTGCCG CACAAGGCCG
TGAATCCGTG TCGTGTACG GGTGGTGGTG GTCACACGGC GTGTTCCGGC

1601 TGGCGGTAGG GTATGTGTCT GAAAATGAGC GTGGAGATTG GGCTCGCAGC
ACCGCCATCC CATACACAGA CTTTACTCG CACCTCTAAC CCGAGCGTGC

1651 CCGTACGCGAG ATGGAAGACT TAAGGCAGCG GCACAAGAAG ATCCAGGCAG
CGACTGCGTC TACCTTCTGA ATTCCGTCCG CGTCTTCTTC TACGTCCGTC

1701 CTGAGTTGTT GTATTCTGAT AAGAGTCAGA GTAACTCCC GTTCCCGTGC
GACTCAACAA CATAAGACTA TTCTCAGTCT CCATTGAGGG CAACGCCACG

1751 TGTAAACGGT GGAGGGCAGT GTACTCTGAG CAGTACTCGT TGCTGCCCGG
ACAATTGCCA CCTCCCGTCA CATCAGACTC GTCATGACCA ACCAGCGCGC

NcoI

1801 CGCGCCACCA GACATAATAG CTGACAGACT AACAGACTGT TCCTTTCCAT
GCCCGGTGGT CTGTATTATC GACTGTCTGA TTGCTGACA AGGAAGGTA

Sall

NcoI

PmlI BclI EcoRV

1851 CGGTCTTTTC TGCAGTCACC GTCCGTCGACA CGTGTGATCA GATATCCCGG
CCCAGAAAAG ACCTCAGTGG CAGCAGCTGT GCACACTAGT CTATAGCGCC

SphI

EcoRV

1901 CGGCTTAGC TAGATGCATG CTCGAGCGGC CGCCAGTGTG ATGGATATCT
GGCGAGATCG ATCTACGTAC GAGCTCCCG GCGCTCACAC TACCTATAGA

NcoI

1951 GCAGAACTCT ATCTTCAGGA TCTCCCATG GAGGGTCTTA GCCTACTCCA
CGTCTTAAGA TAGAAGTCCT AGAGCGGTAC CTCCAGAAAT CGGATGAGGT

2001 ATTGCCCAGA GATAAATTC GAAAAAGCTC TTCTTTGTT TGGGTCACTA
TAACGGGTCT CTATTAAAG CTTCTTCGAG AAAGAACAAC ACCCAGTAGT

2051 TCTTAATTCA AAAGGCCCTT TCCATGCCCT TGGGTGTTGT GACCAACAGC
AGAATAAGT TTTCCGGAAA AGGTACGGAA ACCCACAACA CTGGTTGTCG

2101 ACTTTAGAAG TAACAGAGAT TGACCAGCTA GTCTGCAAGG ATCATCTTGC
TGAATCTTC ATTGTCTCTA ACTGGTCGAT CAGACGTTCC TAGTAGAAGC

2151 ATCAACTGAC CAGCTGAAAT CAGTTGGTCT CAACCTCGAG GGGAGCGGAG
TAGTTGACTG GTCGACTTTA CTCACCCAGA GTTGGAGCTC CCCTCGCCTC

EcoRV

2201 TATCTACTGA TATCCCATCT GCGACAAAGC GTTGGGGCTT CAGATCTGGT
ATAGATGACT ATAGGGTAGA CGCTGTTTCG CAACCCCGAA GTCTAGACCA

2251 GTCCCTCCCC AAGTGGTCAG CTATCAAGCA GGAGAATGGG CTGAAAATTG
CACGGAGGGG TTCACCACTC GATACTCGT CCTCTTACCC GACTTTTAAC

2301 CTACAATCTT GAAATAAAGA AACCGGACGG GACCGAATCC TTACCCCCAC
GATGCTAGAA CTTTATTCTT TTGGCCTGCC CTGCGTTACG AATCGGGGTG

2351 CGCCGGATCG TGTCAAGGCC TTTCCAAGGT CCGGCTATGT TCACAAAGCC
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2401 CAAGGAACCG GGCCTGCCC GGGTGACTAC GCCTTTCACA AGGATCGAGC
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2451 TTCTTCCTC CATGACAGCC TGGCTTCAAC TGTAATTAC AGAGGAGTCA
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2551 ACGTTCTTTC AATCACCCCC CATTGAGAG GCAGCAAACT ACACTCAGAA
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2601 TACATCAAGT TACTATGCCA CATCCTACTT GGACTACGAA ATCGAAATTT
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2651 TTGGTCTCA ACACCTCCAG ACCCTTTTCA AAATTAACAA TAATACTTTT
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2701 GTTCTTCTGG ACAGGCCCCA CACGCCTCAG TTCTTTTTC AGCTGAATGA
CAAGAGACC TGTCCGGGGT GTCCGGAGTC AAGGAAAAGG TCGACTTACT

2751 TACCATTCAA CTTACCAAC AGTTGAGCAA CACAACGGG AAACATAATT
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2801 GGACACTAGA TGCTAATATC AATGCTGATA TTGCTGAATC GGCTTTTTCG
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2901 GAACTTTTAT CGCTCAACGA GACAGAAGAC CATGATGCCA CATCGTCGAG
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2951 AACTACAAAG GGAAGAATCT CCGACCGGGC CACCAGGAAG TATTGGGACC
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3001 TGGTTCCAAA GGATTCCCTT GGGATGGTTT CATTGCACGT ACCAGAAGGG
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3101 GAATACTCAG GAAACTATCA CAGAGACAAC TGCAACAATC ATAGGCCTA
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3151 ACGGTAACAA CATGCAGATC TCCACCATCG GGACAGGACT GAGCTCCAGC
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NotI

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3251 CTCCACAACC TACACACCAA AACTACCAAT GATGACCACC GAGGAACCAA
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3301 CACCAACCAC GAGAACTCT CCTGGCTCAA CAACAGAAGC ACCCACTCTC
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3401 GTCCACAAGC AACGGTCTAA TAACCTCAAC AGTAACAGGT ATTCTTGGGA
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3451 GCCTTGGACT TCGAAAACGC AGCAGAAGAC AAGTTAACAC CAGGCCACG
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3501 GGTAATGCCA ATCCCAACTT ACACTACTGG ACTGCACAAG AACACATAA
CCATTACGT TAGGGTTGAA TGTGATGACC TGACGTGTTT TTGTTGTATT

BamHI

3551 TGCTGCTGGG AITGCCCTGA TCCCGTACTT TCGACCGGGT GCAGAAGGCA
ACGACGACCC TAACCGACCT AGGGCATGAA ACCTGGCCCA CGTCTTCCGT

3601 TATCACTGA AGGCCTTATG CACAACCAA ATGCCTTAGT CTGTGGACTC
ATATGCACT TCCGGAATAC GTCTTGTTT TACGGAATCA CACACCTGAG

3651 AGCAAACTTG CAAATGAAC AACTCAAGCT CTGCAGCTTT TCTTAAGGGC
TCTGTTGAAC GTTACTTTG TTGAATTCCA GACGTGAAA AGAATCCCG

3701 CACGACGGAG CTGCGGACAT ATACCATACT CAATAGGAAG CCCATAGATT
GTGCTCCCTC GACGCCGTGA TATGGTATGA GTTATCCTC CGGTATCTAA

BamHI

3751 TCCTTCTGCG ACGATGGGCC GGGACATGTA GGATCCTGGG ACCAGATTGT
ACGAAGACCC TGCTACCCCG CCCTGTACAT CCTAGGACCC TGGTCTAACA

3801 TGCATTGACC CACATGATTG GACCAAAAAC ATCACTGATA AAATCAACCA
ACGTAACTCG GTGTACTAAC CTGGTTTTTG TAGTGACTAT TTAGTTGGT

3851 AATCATCCAT GATTTCATCG ACAACCCCTT ACCCAATCAG GATAATGATG
TTASTAGGTA CTAAGTAGC TGTGGGAAA TGGGTTAGTC CTATTACTAC

BamHI

3901 ATAATTGGTG GACGGGCTGG AGACAGTGA TCCCTGCAGG AATAGGCATT
TATTAACCA CTGCCCAGCC TCTGTACCT AGGGACGTCC TTATCCGTAA

3951 ACTGGAATTA TTATGCAAT CATGCTCTT CTTTGGCTCT GCAAGCTGCT
TGACCTTAAT AATAACGTTA GTAACGAGAA GAAACCCAGA CGTTCGACGA

BamHI

4001 TTGTTGAATA TCAGAATTCC AGCACTGGCG GCCGTTACTA GTGGATCCGA
AACAACTTAT AGTCTTAAGG TCGTGACCGC CGGCAATGAT CACCTAGGCT

NarI

BamHI

XbaI

KasI

BamHI

4051 GCTCGGATCC AAGCTCTAGA CCAGCGCCCT GGATCCAGAT CTGCTGTGCC
CGACCTTAGG TTCCAGATCT GCTCCGCGGA CCTAGGTCTA GACGACCGG

4101 TTCTAGTGC CAGCCATCTG TTGTTGCCC CTCCCCGTC CTTTCCTTGA
AAGATCAACC GTCGGTAGAC AACAAACGGG GAGCGGCGAC GGAAGGAAT

4151 CCTCGGAAGG TGCCACTCCC ACTGTCCTTT CCTAATAAAA TGACGAAATT
GGGACCTTCC ACGGTGAGGG TGACAGGAAA GGATTATTTT ACTCCTTTAA

4201 GCATCGCATT GTCTGAGTAG GTGTCACTCT ATTCTGGGGG GTGGGGTGGG
CGTAGCGTAA CAGACTCATC CACAGTAAGA TAAGACCCCC CACCCACCC

.....
SphI

4251 GCAGCACAGC AAGCGGGAGG ATTGGGAAGA CAATAGCAGG CATGCTGGGG
CGTCGTGTCTG TTCCCTCTCC TAACCTTCT GTTATCGTCC GTACGACCC

.....
KpnI

4301 ATCGGGTGGG CTCTATGGGT ACCCAGGTGC TGAAGAATTG ACCCGGTTC
TAGGCCACCC GAGATACCCA TGGGTCCACG ACTTCTTAAC TGGGCCAAGG

4351 TCCTGGGCCA GAAAGAAGCA GGCACATCCC CTTCTCTGTG ACACACCCGT
AGGACCCGGT CTTTCTTCGT CCGGTAGCG GAAGAGACAC TGTGTGGGAC

4401 TCCAGCCCC TGGTTCTTAG TTCCAGCCCC ACTCATACCA CACTCATAGC
AGGTGCGGGG ACCAAGAATC AAGGTGCGGG TGAGTATCCT GTGAGTATCG

4451 TCAGGAGGCG TCCGCCCTCA ATCCACCCG CTAAAGTACT TGGAGCGGTC
AGTCCCTCCG AGCGGAAGT TAGGGTGGG GATTTCATGA ACCTCGCCAG

4501 TCTCCCTCCC TCATCAGCCC ACCAAACCAA ACCTAGCCTC CAAGAGTGGG
AGAGGGAGGG AGTAGTGGG TGGTTGGTT TGGATCGGAG GTTCTCACC

4551 AAGAAATTAA AGCAAGATAG GCTATTAAGT GCAGAGGGAG AGAAATGCC
TCTTTAATT TCGTTCTATC CGATAATTCA CGTCTCCCTC TCTTTACGG

.....
XbaI

4601 TCCATCATGT GAGGAAGTAA TGAGAGAAAT CATAGATTT CTTCCGCTTC
AGGTTGTACA CTCCTTCATT ACTCTCTTA GTATCTTAA GAAGCGAAG

4651 CTCGCTCACT GACTCGCTGC GCTCGGTCTG TCGGCTCGG CGAGCGGTAT
GAGCGAGTGA CTGAGCGAG CGAGCCAGCA AGCCGACGCC CCTCGCCATA

4701 CAGCTCACTC AAAGGCGGTA ATACGGTTAT CCACAGAATC AGGGGATAAC
GTCGAGTGAG TTTCCGCCAT TATGCCAATA GGTGTCTTAG TCCCCTATTG

4751 GCAGGAAGA ACATGTGAGC AAAAGGCCAG CAAAAGGCCA GGAACCGTAA
CGTCTTCT TGTACACTCG TTTCCGGTC GTTTCCGGT CCTTGGCAT

4801 AAAGCCCGG TTCTGCGGT TTTCCATAG GCTCCGCCCC CCTGACGAGC
TTTCCGGCGC AACGACCGCA AAAAGGTATC CGAGCGGGG GGACTGCTCG

4851 ATCACAAAAA TCGACGCTCA ACTCAGAGGT GGCGAAACCC GACAGGACTA
TAGTGTCTTT AGCTCGGAGT TCACTCTCCA CCGCTTTGG CTGTCTGAT

4901 TAAAGATACC AGCGGTTTCC CCTGGAAGC TCCCTCGTGC GCTCTCCTGT
ATTCTATGCG TCCGCAAGG GGGACCTTC AGGGAGCAG CGAGAGGACA

4951 TCCGACCTG CCGCTTACCG GATACCTCTC CGCCTTCTC CCTTCGGGAA
AGGCTGGGAC GCGGAATGGC CTATGGACAG GCGGAAAGAG GGAAGCCCTT

5001 GCGTGGCGCT TTCTCAATCC TCACGCTGTA GGTATCTCAG TTCGGGTGAG
CGCACCCGCA AAGAGTTACG AGTGGACAT CCATAGAGTC AAGCCACATC

5051 GTCGTTCCCT CCAAGCTGGG CTCTGTGCAC GAACCCCCCG TCCAGCCCCG
 CAGCAAGCGA GGTTCGRACC GACACACGTG CTTGGGGGGC AAGTCGGGCT

 5101 CCGCTGCGGC TTATCCGGTA ACTATCGTCT TGAATCCAAC CCGGTAAGAC
 GCGGACGCGG AATAGGCCAT TGATAGCAGA ACTCAGGTTG GGCATTCTG

 5151 ACGACTTATC GCCACTGGCA GCAGCCACTG GTAACAGCAT TAGCAGAGCG
 TGCTGAATAG CCGTGACCGT CGTCGGTGAC CATTGTCTTA ATCGTCTCGC

 5201 AGGTATGTAG GCGGTGCTAC AGAGTCTTG AAGTCGTGGC CTAACACGG
 TCCATACATC CCCCACGATG TCTCAAGAAC TTCACCACCG GATTGATGCC

 5251 CTACACTAGA AGGACAGTAT TTGGTATCTG CGCTCTCTG AAGCCAGTTA
 GATGTGATCT TCCTGTGATA AACCATAGAC GCGAGACGAC TTCGGTCAAT

 5301 CCTTCGGAAA AAGAGTTGGT AGCTCTTGAT CCGGCAACA AACCAACGCT
 GCAAGCCTTT TTCTCAACCA TCGAGAACTA GCGCGTTTGT TTCGTGGCGA

 5351 GGTAGCGGTG GTTTTTTTGT TTGCAAGCAG CAGATTACGC GCAGAAAAA
 CCATCGCCAC CAAAAAACA AACGTTCTGC GTCTAATGCC CGTCTTTTTT

 5401 AGGATCTCAA GAAGATCCTT TGATCTTTTC TACGGGGTCT GACGCTCAGT
 TCCTAGAGTT CTCTAGGAA ACTAGAAAAC ATGCCCCAGA CTGCGAGTCA

 5451 GGAACGAAAA CTCACGTTAA GGGATTTTGG TCATGAGATT ATCAAAAAGG
 CCTTGCTTTT GAGTGCAATT CCCTAAACC AGTACTCTAA TAGTTTCTCC

 5501 ATCTTCACCT AGATCCTTTT AAATTAAAAA TGAAGTTTAA AATCAATCTA
 TAGAAGTGA TCTAGGAAA TTTAATTTTT ACTTCAAAAT TTAGTTAGAT

 5551 AAGTATATAT GAGTAAACTT GGTCTGACAG TTACCAATGC TTAATCAGTG
 TTCATATAA CTCATTTGAA CCAGACTGTC AATGGTTACG AATTAGTCAC

 5601 AGGCACCTAT CTCACGATC TGCTATTTTC GTTCATCCAT AGTCCCTGA
 TCCGTGGATA GAGTCGCTAG ACAGATAAAG CAAGTAGGTA TCAACGGACT

 5651 CTCGGGGGGG GGGGGGGCCT GAGGTCTGCC TCGTGAAGAA GGTGTGCTG
 GAGGCCCCC CCCCCCGCGA CTCAGACGG AGCACTTCT CCACAACGAC

 5701 ACTCATACCA GGCCTGAATC GCCCCATCAT CCAGCCAGAA AGTGAGGGAG
 TGAGTATGTT CCGCACTTAG CCGGGTAGTA GGTGGTCTT TCACTCCCTC

 5751 CCACGGTTGA TGAGAGCTTT GTTGTAGGTG GACCAGTTGG TGATTTTGA
 GGTGCCAAT ACTCTCGAAA CAACATCCAC CTGGTCAACC ACTAAAATT

 5801 CTTATGCTTT GCCACGGAAC GGTCTCCGTT GTCCGGAAGA TCCGTGATCT
 GAAAACGAAA CCGTGCCTTG CCAGACGCAA CAGCCCTTCT ACGCACTAGA

 5851 GATCCTTCAA CTCAGCAAAA GTTCGATTTA TTCAACAAA GCGCCCTCCC
 CTAGGAAGTT GAGTCGTTTT CAAGCTAAAT AAGTTGTTTC GCGGCGAGG

 5901 GTCAAGTCAG CGTAATGCTC TGCCAGTGTT ACAACCAATT AACCAATTCT
 CAGTTCAGTC GCATTACGAG ACGGTCACAA TOTTGGTTAA TTGGTTAAGA

 5951 GATTAGAAA ACTCATCGAG CATCAAATGA AACTGCAATT TATTCATATC
 CTAATCTTTT TGAGTAGCTC GTAGTTTACT TTCACGTTAA ATAAGTATAG

6001 AGGATTATCA ATACCATATT TTTGAAAAAC CCGTTTCTGT AATGAAGGAG
TCCTAATAGT TATGGTATAA AAACTTTTTC GCCAAGACA TTACTTCCTC

6051 AAAACTCACC GAGGCAGTTC CATACGATGG CAAGATCCTG GTATCGGTCT
TTTTGAGTGG CTCCGTCAG GTATCCCTACC GTTCTAGGAC CATACCCAGA

6101 GCGATTCCGA CTCGTCCAAC ATCAATACAA CCTATTAAAT TCCCTCTGTC
CGCTAAGGCT GAGCAGGTG TAGTTATGTT CGATAATTAA AGGGGAGCAG

6151 AAAATAAGG TTATCAAGTG AGAAATCACC ATCAGTGACG ACTGAATCCG
TTTTTATCC AATAGTTTAC TCTTAGTGAG TACTCACTGC TGACTTAGGC

HindIII

6201 GTGGAATGG CAAAAGCTTA TGCATTTCTT TCCAGACTTG TCCAACAGCG
CACTCTTACC GTTTTCCAAAT ACGTAAAGAA AGGTCTGAAC AAGTTGTCCG

6251 CAGCCATTAC GCTCGTCATC AAAATCACTC GCATCAACCA AACCGTTATT
GTCGTAATG CGAGCAGTAG TTTTAGTGAG CCTAGTTGCT TTGGCAATAA

PvuI

6301 CATTCTGAT TCCGCTGAG CGAGACGAAA TACCGGATCG CTCTTAAAAG
GTAGCACTA ACGCGGACTC GCTCTGCTTT ATGCGGTAGC GACAATTTTC

6351 GACATTACA AACAGGAATC GAATGCAACC GCGCCAGGAA CACTGCCAGC
CTGTAAATGT TTGTCCCTAG CTTACGTTGG CCGCGTCTT GTGACGGTCG

6401 GCATCAACAA TATTTTCACC TGAATCAGGA TATCTTCTA ATACCTGGAA
CGTAGTTGTT ATAAAAGTGG ACTTAGTCTT ATAAGAAGAT TATGGACCTT

6451 TGCTCTTTC CCGGGGATCG CAGTGGTGAG TAACCATGCA TCATCAGGAG
ACGACAAAAG GCGCCCTACC GTCACCACTC ATTGGTACGT ACTAGTCTC

6501 TACCGATAAA ATGCTTGATG GTCGGAAGAG GCATAAATC CGTCAGCCAG
ATGCTTATT TACGAACTAC CAGCCTTCTC CGTATTAAAG GCAGTCGGTC

6551 TTTAGTCTGA CCATCTCATC TGTAACATCA TTGGCAACGC TACCTTTGCC
AAATCAGACT GGTAGAGTAG ACATTGTAGT AACCGTTGCG ATGGAACCGG

ClaI

6601 ATCTTTCAGA AACAACTCTG GCGCATCGGG CTCCCATAC AATCGATAGA
TACAAAGTCT TTGTTGAGAC CCGGTAGCCC GAAGGGTATG TTAGCTATCT

6651 TTGTCCACC TGATTGCCC ACATTATCCG GAGCCCATTT ATACCCATAT
AACAGCGTGG ACTAACGGGC TGTAAATAGCG CTCGGGTAAA TATCGGTATA

6701 AAATCAGCAT CCATGTTGGA ATTTAATCCG GGCCTCGAGC AAGACGTTTC
TTTAGTCTGA GGTACAACCT TAAATTAGCG CCGGAGCTCG TTCTGCAAG

6751 CCGTTGAATA TGGCTCATAA CACCCCTTGT ATTACTGTTT ATGTAAGCAG
GGCACTTAT ACCGATATT CTGGGGAACA TAATGACAAA TACATTGCT

6801 ACAATTTTAT TGTTTATGAT GATATATTTT TATCTTGTCG AATGTAACAT
TGTCAAAATA ACAAGTACTA CTATATAAAA ATAGAACACG TTACATTGTA

DraIII

6851 CAGAGATTTT GAGACACAC GTGGCTTTCC CCCCCCCCCC ATTATTGAAG
GTCTCTAAAA CTCTGTGTTG CACCGAAAGG GCGGGGGGGG TAATAACTTC

6901 CATTATCAG GOTTATTGTC TCATGAGCGG ATACATATTT GAATGTATTT
GTAAATAGTC CCAATAACAG AGTACTCGCC TATGTATAAA CTACATAAA

6951 AGAAAAATAA ACAAAATAGGG GTTCCGCCCA CATTTCGCCG AAAAGTGCCA
TCITTTTTATT TGTTTATCCC CAAGGCCCGT GTAAAGGGGC TTTTCACGGT

7001 CCTCAGTCT AAGAAACCAT TATTATCATG ACATTAACTT ATAAAAATAG
GGACTGCAGA TTCTTTGGTA ATAATAGTAC TGTAATGGA TATTTTATC

7051 GCGTATCAG AGCCCTTTTC GTC
CGCATAGTGC TCCGGGAAAG CAG

09600766-054404

SEQUENCE LISTING ID NO: 3

pVR 1012-GP(Z)

General Description

DNA pVR 1012-GP(Z)
 Local object
 Created: 09/15/98 05:06PM
 Last Modification Date: ? (no data)
 length: 7285 bp
 storage type: Basic
 form: Circular

Comments

Restriction Map

DraIII: 1 site CACCKKNGTG
 GTCKKCTAC
 HindIII: 1 site AAGCTT
 TTGGA
 HpaI: 1 site GTTAC
 CAATTG
 KsaI: 1 site GCGGCC
 CTCGGG
 NarI: 1 site GCGGCC
 CTCGGG
 NotI: 1 site GCGGCCGC
 CGCCGCG
 PmlI: 1 site CACGTG
 GTGCAC
 PvuI: 1 site CGATCG
 GCTAGC
 SacII: 1 site CCGCGG
 GGCGCC
 XbaI: 1 site TCTAGA
 AGATCT
 XhoI: 1 site CTCGAG
 GAGCTC
 EcoRV: 2 sites GATATC
 CTATAG
 NcoI: 2 sites CCATGG
 GGTACC
 NdeI: 2 sites CACATG
 GTATAC
 SphI: 2 sites GCATGC
 CGTACG

Functional Map

CDS (4 signals)

CMV IE 5' UT

Start: 886 End: 1129

CMV IE INT

Start: 1130 End: 1840

TbGH

Start: 4302 End: 4854

Kan^r

Start: 6350 End: 6972 (Complementary)

09600756-051401
 104150-9900950

Misc_feature (2 signals)

CMV enhancer

Start: 248 End: 885

GP(Z)

Start: 1870 End: 4301

Annotations

09600766-051404
104750-09700960

1 TCGCGCGTTT CGGTGATGAC GGTGAAAACC TCTGACACAT GCAGCTCCCG
ACCGCGCAAA GCCACTACTG CCACTTTTGG AGACTGTGTG CGTCGAGGCG

51 GAGACGGTCA CAGCTTGTCT GTAAACGGAT GCCGGGAGCA GACAAGCCCG
CTCTGCCAGT GTCGAACAGA CATTCGCCYA CGGCCCTCGT CTGTTCCGGC

101 TCAGGGCGCG TCAGCGGGTG TTGGCGGGTG TCGGGGCTGG CTTAACTATG
AGTCCCGCGC AGTCGCCCCAC AACCGCCAC AGCCCCGACC GAATTGATAC

NdeI

151 CGGCATCAGA GCAGATTGTA CTCAGAGTGC ACCATATCGG GTGTGAATA
CGCGTAGTCT CGTCTAACAT GACTCTCAG TGGTATACGC CACACTTTAT

201 CCGCACAGAT CGGTAAAGGAG AAAATACCGC ATCAGATTGG CTATTGGCCA
GGCGTGCTA CGCATTCCTC TTTTATCGCG TAGTCTAAC GATAACCGGT

251 TTGCATACGT TGTATCCATA TCATAATATG TACATTATA TTGGCTCATG
AACGTATCCA ACATAGGTAT AGTATTATAC ATGTAAATAT AACCGAGTAC

301 TCCAACATTA CCGCCATGTT GACATTGAT ATTGACTAGT TATTAAATAGT
AGGTGTANT GCCCGTACAA CTGTAACTAA TAACTGATCA ATAAATTATCA

351 AATCAATTAC GGGGTCATTA GTTCATAGCC CATATATGGA GTTCGGCGTT
TTAGTTAATG CCCAGTAAT CAAGTATCGG GTATATACCT CAAGCGCGAA

401 ACATAACTTA CGGTAAATGG CCCGCCGTGC TGACCGCCCA ACGACCCCG
TGTATTGAAT CCGATTTACC GGGCGGACCG ACTGGCGCGT TGCTGGGGCG

451 CCCATTGACG TCAATAATGA CGTATGTTCC CATAGTAACG CCAATAGGGA
GGGTAACTGC AGTTATTACT GCATACAAGG GTATCATGCG GGTATCCCT

501 CTTTCCATTG ACGTCAATGG GTCGAGTATT TACGGTAAAC TGCCCACTTG
GAAGGTAAAC TGCAGTTACC CACCTCATAA ATGCCATTG ACGGGTGAAC

NdeI

551 GCAGTACATC AAGTGTATCA TATGCCAAGT ACGCCCCCTA TTGACGTCAA
CGTCATGTAG TTCACATAGT ATACGGTTCA TGCGGGGGAT AACTGCAGTT

601 TGACGGTAAA TGGCCCCCCT GGCATTATGC CCAGTACATG ACCTTATGGG
ACTGCCATTG ACCGGGCGGA CCGTAATACG GGTATGTAC TGGAAATACCC

NcoI

651 ACTTTCCTAC TTGGCAGTAC ATCTACGTAT TAGTCATCGC TATTACCATG
TGAAAGGATG AACCGTCATG TAGATGCATA ATCAGTAGCG ATAATGGTAC

NcoI

701 GTGATCGCGT TTTGGCAGTA CATCAATGGG CGTCGATAGC GGTTTGACTC
CACTACGCCA AAACCGTCAT GTAGTTACCC GCACCTATCG CCAAACTGAG

751 ACCGGGACTT CCAAGTCTCC ACCCCATGTA CGTCAATGGG AGTTTGTTTT
TGCCCTTAAA GGTTCAGAGG TGGGGTAACT GCAGTTACCC TCAACAAAA

801 GCCACCAAAA TCAACGGGAC TTCCAAAAT GTCGTAACAA CTCCGCCCCA
CCGTGGTTTT ACTTGCCCTC AAAGGTTTTA CAGCATGTG GAGGCGCGGT

851 TTGACGCAAA TGGCGCGTAG CGGTGTACGG TCGGAGGTCT ATATAAGCAG
AACTGCGTTT ACCCGCCATC CGCACATGCC ACCCTCCAGA TATATTGCTC

901 AGCTCGTTTA GTGAACCGTC AGATCGCCTG GAGACGCCAT CCACCGTGT
TCGACCAAT CACTTGGCAG TCTAGCGGAC CTCTCCGGTA GGTGCGACAA

SacII

951 TTGACCTCCA TAGAAGACAC CGGGACCGAT CCAGCCTCCG CGGCGCGGAA
AACTGGAGGT ATCTTCTGTG GCCCTGGCTA GGTCCGAGGC GCCGGCCCTT

1001 CCGTGCATTG GAACCGGGAT TCCCCGTGCC AAGAGTGACG TAAGTACCGC
GCCACGTAAC CTTGCGCCTA AGGGGCACGG TTCTCACTGC ATTCAATGGC

SphI

1051 CTATAGACTC TATAGGCACA CCCCTTTGGC TCTTATGCAT GCTATACTGT
GACATCTGAG ATATCGGTGT GGGGAAACCG AGAATACGTA CGATATGACA

1101 TTTTGGCTTG GGGCCTATAC ACCCCCGCTT CCTTATGCTA TAGGIGATGG
AAACCGAAC CCCGGATATG TGGGGCGGAA GGAATACGAT ATCCACTACC

1151 TATAGCTTAG CCTATAGGTG TGGGTATTG ACCATTATG ACCACTCCCC
ATATCGAATC GGATATCCAC ACCCAATAAC TGGTAATAAC TGGTGACGGG

1201 TATTGGTGAC GATACTTCC AATACTAATC CATAACATGG CTCTTTGCCA
ATAACCACTG CTATGAAGG TAATGATTAG GTATTGTACC GAGAAACGGT

1251 CAATATCTC TATTGGCTAT ATGCCAATAC TCTGTCTTC AGAGACTGAC
GTGTATAGAG ATAACCGATA TACGGTTATG AGACAGGAAG TCTCTGACTG

1301 ACGGACTCTC TATTTTACA GGATGGGGTC CCATTATTA TTTACAAAT
TGCTTGACAC ATAAAAATGT CCTACCCAG GGTAAATAAT AAATGTTTAA

1351 CACATATACA ACAACGCCGT CCCCCGTGCC CGCAGTTT ATTAAACATA
GTGTATATGT TGTTCGGCA GGGGGCACGG CGGTCAAAA TAATTTGTAT

1401 CGGTGGGATC TCCACCGGAA TCTCGGTAC GTGTTCCGGA CATGGGTCT
CGCACCCTAG AGGTGCGCT AGAGCCCATG CACAAGGCCT GTACCCGAGA

1451 TCTCCGCTAG CGCCGGAGCT TCCACATCCG AGCCCTGGTC CCATGCCCTC
AGAGGCCATC GCCGCTCGA AGGTGTAGG TCGGGACCAG GGTACGGAGG

1501 AGCGGCTCAT GGTGGCTCGG CAGCTCCTG CTCCTAACAG TGGAGCCAG
TCCCGAGTA CCAGCGAGCC GTCGAGGAAC GAGGATTCTC AACTCCGGTC

1551 ACTTAGGCAC AGCACAATC CCACCACCAC CAGTGTCCG CACAAGGCCG
TGAATCCGTG TCGTGTACG GGTGGTGGT GTCACACCGC GTGTCCGGC

1601 TGGCGGTAGG GTATGTGTCT GAAATGAGC GTGGACATTG GGCTCGCAG
ACCCCATCC CATACACAGA CTTTACTCG CACCTCTAAC CCGAGCGTGC

1651 GCTGACGCAG ATGGAAGACT TAAGCCACCG CCAGAGGAG ATGCAGGCAG
CGACTGCGTC TACCTTCTGA ATTCCGTCCG CGTCTTCTC TACGTCCGTC

1701 CTGAGTTGTT GTATTCTGAT AAGAGTCAGA GGTAACTCCC GTTGGCGTGC
GACTCAACA CATAGACTA TTCTCACTCT CCATTGAGG CAACGCCACG

HpaI

1751 TGTTAACGGT GGACGGCAGT GTAGTCTGAG CAGTACTCGT TCCTGCCGCG
ACAATTGCCA CCTCCCGTCA CATCAGACTC CTCATGAGCA ACCACGGCGC

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NcoI

1801 CGCGCCACCA GACATAATAG CTGACAGACT AACAGACTGT TCCTTTCCAT
GCCCGGTGGT CCGTATTATC GACTGTCTCA TTGTCTGACA AGGAAAGCTA

.....

NcoI PstI EcoRVNotI

1851 GGGTCTTTTC TCGACTCACC GTCCTCGACA CCGTGATCA GATATCGCGG
CCCAGAAAAG ACCTCAGTGG CAGCAGCTGT GCACACTAGT CTATAGCGCC

.....

NarI

NotI XbaI KasI

1901 CCGCTCTAGA CCAGGGCGCT GGATCGATCC GCGATGAAGA TTAAGCCGAC
GGCGAGATCT GGTCCGCGCA CCTAGCTAGG CGCTACTTCT AATTCCGGTG

.....

1951 AGTGAGCGTA ATCTTCATCT CTCCTAGATT ATTTGTTTTT CACAGTAGGG
TCACTCGCAT TAGAAGTAGA GAGAACTCAA TAAACAAAAG GTCTCATCCC

.....

2001 GTCGTGAGGT CCTTTTCAAT CGTGTAAACA AAATAAACTC CACTAGAAGG
CAGCAGTCCA GGAAAAGTTA GCACATTGGT TTTATTGAG GTGATCTTCC

.....

2051 ATATTGTGGG GCAACAACAC AATGGGCGTT ACAGCAATAT TCCAGTTACC
TATAACACCC CGTTGTTGTG CTACCCGCAA TGTCCTTATA ACGTCAATGG

.....

2101 TCCTGATCGA TTCAAGAGGA CATCATCTTT TCTTTGGGTA ATTATCCTTT
AGCACTAGCT AAGTTCICCT GTAGTAAGAA AGAAACCCAT TAATAGGAAA

.....

2151 TCCAAAGAAC ATTTTCCATC CCACTTGGAG TCATCCACAA TAGCACATTA
AGGTTTCTTG TAAAGGTAG GGTGAACCTC ACTAGGTGTT ATCGTGTAA

.....

2201 CAGGTAGTGC ATGTGCACAA ACTAGTTTGT CCGTGAACAC TGTATCCAC
GTCCAATCAC TACAGCTGTT TGATCAACA GCACGTTTG ACAGTAGGTG

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2251 AAATCAATTG AGATCAATTG GACTGAATCT CGAAGGGAAT GCAGTGGCAA
TTTAGTTAAC TCTAGTCAAC CTGACTTAGA GCTTCCCTTA CCTCACCGTT

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2301 CTGACGTGCC ATCTGCAACT AAAAGATGGG GCTTCAGGTC CGGTGTCCCA
GACTGCACGG TAGACGTTGA TTTTCTACCC CGAAGTCCAG GCCACAGGGT

.....

2351 CCAGAGGTGG TCAATTATGA ACCTGGTGAA TGGGCTGAAA ACTGCTACAA
GGTTTCCACC AGTTAATACT TCGACCACTT ACCCGACTTT TGACGATGTT

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2401 TCTTGAATC AAAAAACCTG ACGGCACTGA GTGTCTACCA GCAGCGCCAG
AGAAGTTTAG TTTTMTGGAC TGCCCTCACT CACAGATCGT CGTCGCCGTC

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2451 ACGGGATTCT GGGCTTCCCC CGGTGCCGGT ATGTCCACAA AGTATCAGGA
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.....

2501 ACGGGACCGT GTGCCGAGA CTTTGCCTTC CATAAAGAGG GTGCTTCTT
TGCCCTGGCA CACGGCCTCT GAAACGGAA GATTTCTCC CACGAAAGAA

.....

2551 CCTGTATGAT CGACTTGCTT CCACAGTTAT CTACCGAGGA ACGACTTTCG
GGACATACTA GCTGAACGAA GGTGTCAATA GATGGCTCCT TGCTGAAAGC

2601 CTGAAGGTGT CGTTGCATTY CTGATACTGC CCCAAGCTAA GAAGGACTTC
GACTTCCACA GCAACGTAAA GACTATGACG GGGTTCGATT CTTCCTGAAG

2651 TTCAGCTCAC ACCCCTTGAG AGAGCCGGTC AATGCAACGG AGGACCCGTC
AAGTCGAGTG TGGGGAATC TCTCGGCCAG TTACGTTGCC TCCTCGGCAG

EcoRV

2701 TACTGGCTAC TATTCTACCA CAATTAGATA TCAGGCTACC GGTTTTGCAA
ATCACCAGATG ATAAGATGGT GTTAACTAT AGTCCGATCG CCAAAACCTT

2751 CCAATGAGAC AGAGTACTTG TTCGAGGTTG ACAATTTGAC CTACGTCCAA
GGTACTCTG TCTCATGAAC AAGCTCCAAC TGTAAACTG GATCCAGGTT

2801 CTGGAATCAA GATTACACAC ACAGTTTCTG CTCCAGCTGA ATGAGACAAT
GAAGTTAGTT CTAAGTGTGG TGTCAAAGAC GAGGTGCACT TACTCTGTTA

2851 ATATACAAGT GGGAAAAGCA GCAATACCAC GGGAAACTA ATTTGGAAGG
TATATGTTCA CCTTTTCCG CGTTATGGTG CCCTTTTGAT TAAACCTTCC

2901 TCAACCCCGA AATTGATACA ACAATCGGGG AGTGGGCTT CTGGGAAACT
AGTTGGGGCT TTAAGTATGT TGTAGCCCC TCACCCGGAA GACCCTTTGA

2951 AAAAAAACC TCACTAGAAA AATTCCGAGT GAAGAGTGT CTTCACAGT
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3001 TGTATCAAAC GGAGCCAAAA ACAATAGTGG TCAGAGTCCG GCGCGAACTT
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3051 CTCCCGACCC ACGGACCAAC ACAACAATG AACACCACAA AATCATGGCT
GAAGGCTGGC TCCCTGGTTG TGTGTGAC TTCTGGTGT TTAGTACCGA

3101 TCAGAAAAT CCTCTGCAAT GGTCAAGTG CACAGTCAAG GAAGGGAAGC
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3151 TGCAGTGTGG CATCTAACAA CCCTTGCCAC AATCTCCAGG AGTCCCAAT
ACGTACACAG GTAGATTGTT GGGAACGGTG TTAGAGGTGC TCAGGGGTTA

3201 CCCTCACAAC CAAACCAGGT CCGGACAACA GCACCCATA TACACCCGTG
GGGAGTGTG GTTTCGTCCA GGCCTGTTGT CGTGGGTATT ATGTGGGCAC

3251 TATAAACTTG ACATCTCTGA GCGAACTCAA GTTGAACAA ATCACCAGAG
ATATTGAAAC TGTAGAGACT CCGTTCAGTT CAACTTGTTG TAGTGGCGTC

3301 AACAGACAC GACAGCACAG CCTCCGACAC TCCCTCTGCC ACGACCCGAG
TTGTCTGTG CTCTCGTGC GGAGGCTGTG AGGGAGACGG TCCTGGCGTC

3351 CCGGACCCCG AAAAGCAGAG AACACCAACA CGAGCAAGAG CACTGACTTC
GGCCTGGGGG TTTTCGTCTC TTCTGTTGT CCTCGTTCTC GTGACTGAAG

3401 CTGGACCCCG CCACCACAAC AAGTCCCAA AACCAAGCG AGACCGCTGG
GACCTGGGCG GGTGGTGTG TTCAGGGGTT TTGGTGTGCG TCTGGCGACC

3451 CAACAACAAC ACTCATCACC AAGATACCGG AGAAGAGAGT GCCAGCAGCG
GTGTGTTGTTG TGAAGTAGTG TTTATAGGCC TCTTCTCTCA CGGTCTGTGC

3501 GGAAGCTAGG CTTAATTACC AATACTATTG CTGAGATCGC ACGACTGATC
CCTTCGATCC GAATTAATGG TTATGATAAC GACCTCAGCG TCCTGACTAG

3551 ACAGGCGGGA GAAGAAGTCG AAGAGAAGCA ATTGTCAATG CTCACCCCAA
TGTCGCCCTT CTTCTTGAGC TCTCTTTCGT TAACAGTTAC GAGTTGGGTT

3601 ATGCAACCCCT AATTACATT ACTGGACTAC TCAGGATGAA GGTGCTGCAA
TACGTTGGGA TTAAATGTAA TGACCTGATG AGTCTACTT CCACGACGTT

3651 TCGGACTGGC CTGGATACCA TATTTCGGGC CAGCAGCCGA GCGAATTAC
AGCCTGACCG GACCTATGTT ATAAAGCCCG CTCCTCGGCT CCCTTAAATG

3701 ATAGAGGGCC TAATGCACAA TCAAGATGGT TTAATCTGTC GGTGAGACA
TATCTCCCGC ATTACGTTT AGTTCTACCA AATTAGACAC CCAACTCTGT

3751 GCTGGCCAC GAGACGACTC AAGCTCTTCA ACTGTTCTTG AGAGCCACAA
CGACCGGTTG CTCGCTGAG TCGAGAAGT TGACAAGGAC TCTCGGTGTT

3801 CTGAGCTAGC CACCTTTTCA ATCCTCAACC GTAAGGCAAT TGATTCTTGG
GACTCGATGC GTGGAAGT TAGGAGTTGG CATTCGGTTA ACTAAAGAAC

3851 CTGCAGCGAT GGGCGGGCAC ATGOCACATT CTGGGACCGG ACTGCTGTAT
GAGCTGCTA CCGCGCCGTG TACGCTGTA GACCTGGCC TGACGACATA

3901 CGAACCACAT GATTGCACCA AGAACATAAC AGACAAAT GATCAGATTA
GCTTGCTGTA CTAACCTGGT TCTGTATTG TCTGTTTAA CTAGTCTAAT

3951 TTCAAGATT TCTTGATAAA ACCCTTCCCG ACCAGCGGGA CAATGACAT
AAGTACTAA ACAACTATT TGGGAAGGCC TGCTCCCTT GTTACTGTTA

4001 TGGTCGACAG CATGGAGACA ATGGATACCG GCAGGTATTG GAGTACAGG
ACCACCTGTC CTACCTCTGT TACCTATGGC CGTCCATAAC CTCATGTCC

4051 CGTTATAATT GCAGTTATCG CTTTATTCTG TATATGAAA TTTGTCTTTT
GCAATATTAA CGTCAATAGC GAAATAAGAC ATATAGTTT AAACAGAAA

4101 AGTTTTCTT CAGATTGCTT CATGGAAGG CTCAGCTCA AATCAATCAA
TCAAAACAA GTCTAACGAA GTACCTTTTC GAGTCGGAGT TTAGTTACTT

4151 ACCAGGATTT AATTATATGG ATTACTTGAA TCTAAGATTA CTTGACAAAT
TGGTCTTAA TTAATATACC TAATGAAGT AGATTCTAAT GAAGCTTTA

4201 GATAATATAA TACACTGGAG CTTTAAACAT AGCCAATGTG ATTCTAACTC
CTATTATATT ATGTGACCTC GAAATTGTA TCGGTTACAC TAAGATTGAG

4251 CTTTAAACTC ACAGTTAATC ATAAACAAGG TTTGGTACCG AGCTCGAATT
GAAATTTGAG TGTCAATTAG TATTGTCC AAACCATGGC TCGAGCTTAA

4301 ATCTGCTGTG CCTTCTAGTT GCCAGCCATC TGTGTTTGC CCTCCCGCG
TAGACGACAC GGAAGATCAA CGGTGGGTAG ACAACAAACG GGGAGGGGGC

4351 TGCCTTCTT GACCTGGA GGTGCACTC CCACTGTCTT TTCTAATAA
ACGGAAGGAA CTGGGACCT CCACGGTGAG GGTGACAGCA AAGGATTATT

4401 AATGAGGAAA TTGCATCGCA TTGTCTGAGT AGGTGTCATT CTATTCTGGG
TTACTCCTTT AACGTAGCGT AACAGACTCA TCCACAGTAA GATAAGACCC

4451 GGGTGGGGTG GGGCAGCCACA GCAAGGGGGA GGATTGGGAA GACATACCA
CCCACCCAC CCCGTCTGT GTTCCCGCT CCTAACCTT CTGTTATCGT

SphI

4501 GGCATGCTGG GGATCGGGTG GGCTCTATGG GTACCCAGGT GCTGAAGAAT
CCGTACGACC CCTACGCCAC CCGAGATACC CATGGGTCCA CGACTTCTTA

4551 TGACCCGGTT CCTCTGGGC CAGAAACAAG CAGGCACATC CCCTTCTCTG
ACTCGGCCAA CGAGGACCCG GTCTTCTTC GTCCGTGTAG GCGAAGAGAC

4601 TGACACACCC TGTCCAGGCC CCTGGTCTTT AGTCCAGCC CCACTCATAG
ACTGTGTGGG ACAGGTCCGG GGACCAAGAA TCAAGGTCCG GGTGAGTATC

4651 GACACTCATA GCTCAGGAGG GCTCCCGCTT CAATCCACCC CCGTAAAGTA
CTGTGAGTAT CGAGTCTCC CGAGCCGGA GTTAGGTGG CCGATTTCAT

4701 CTGGAGCCG TCTCTCCCTC CCTCATCAGC CCACCAACC AAACCTAGCC
GACCTCGCC AGACAGGGAG CGAGTAGTCC GGTGGTTGG TTGGATCGG

4751 TCCACAGTG GGAAGAAAT AAAGCAAGAT AGGCTATTAA GTGCACAGGG
AGGTTCTCAC CCTCTTTAA TTCTGTCTA TCCGATAAT CACGTCTCC

4801 AGAGAAAATG CCTCCAACAT GTGAGGAAGT AATGAGACAA ATCATAGAAT
TCTCTTTAC GGAGGTTGTA CACTCCTTCA TTACTCTCTT TAGTATCTTA

4851 TTCTTCGGT TCCTCGCTCA CTGACTCGCT GCGCTCGGTC GTTCGGCTGC
AAGAGGCCA AGGAGCGAGT GACTGAGCGA CCGAGCCAG CAAGCCGACG

4901 GCGCAGCGGT ATCAGCTCAC TCAAGGCGG TAATACGGTT ATCCACAGAA
CCGCTCGCCA TAGTCCAGTG AGTTCCGCC ATTATGCCAA TAGGTGTCTT

4951 TCAGGGGATA ACGCAGGAAA GAACATCTCA GCAAAACGCC AGCAAAAGGC
AGTCCCTAT TCGCTCCTTT CTGTACTACT CGTTTCCGG TCGTTTCCG

5001 CAGGAACCGT AAAAAGGCCG CGTTGCTGGC GTTTTCCAT AGGCTCCGCC
GTCTTGGCA TTTTCCGGC GCAACGACCG CAAAAGGTA TCCGAGCCGG

5051 CCCCTGACGA GCATCAGAAA AATCGACGCT CAAGTCAGAG GTGGCGAAG
GGGACTGCT CGTAGTGTTT TTAGTCCGA GTTCAGTCTC CACCGCTTG

5101 CCGACAGGAC TATAAGATA CCAGGCGTTT CCCCCTGGAA GCTCCCTCGT
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5151 GCGCTCTCT GTTCCGADCC TGCCGTTAC CGGATACCTG TCCGCTTTC
CGCGAGGGA CAAGGCTGGC ACGGCGAATG GCCTATGGAC AGCGGAAAG

5201 TCCCTTCGGG AAGCGTGGC CTTTCTCAAT GCTCAGCTG TAGGTATCTC
AGGGAAGCCC TTCGCACCG GAAAGAGTTA CGAGTCCGAC ATCCATAGAG

5251 AGTCCGTGT AGGTCTGTC CTCCAAGCTG GCTGTGTGC ACGAACCOC
TCAAGCCACA TCCAGCAAGC GAGGTTCCG CCGACACAG TCGTGGGGG

5301 CGTTCAGCCC GACCGCTGCG CCTTATCCGG TAACTATCGT CTTGAGTCCA
GCAAGTCGGG CTGGCGACGC GGAATAGGCC ATTGATAGCA GAACTCAGGT
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5351 ACCCGGTAAAG ACAGGACTTA TCGCCACTGC CAGCAGCCAC TGGTAACAGG
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5401 ATTAGCAGAG CGAGGTATGT ACCCGGTGCT ACAGAGTTCT TGAAGTGGTG
TAATCGTCTC GCTCCATACA TCGCCACGA TGTCTCAAGA ACTTCACCAC
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5451 CCCTAACTAC GGCTACACTA CAAGGACAGT ATTTGGTATC TCGGCTCTGC
CGGATTGATG CCGATGTGAT CTTCTGTCTA TAAACCATAG ACCCGAGACG
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5501 TGAAGCCAGT TACCTTCGGA AAAAGAGTTG GTAGCTCTTG ATCCGGCAAA
ACTTCGGTCA ATGGAAGCCT TTTTCTCAAC CATCGAGAAC TAGGCCGTTT
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5551 CAACCCACCG CTGGTAGCGG TGGTTTTTTT GTTTCGAAGC AGCAGATTAC
GTTTGGTGGC GACCATCGCC ACCAAAAAAA CAACCGTTCC TCGTCTAATG
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5601 CCGCAGAAAA AAAGGATCTC AAGAAGATCC TTTGATCTTT TCTACGGGGT
CGGCTCTTTT TTTCTAGAG TTCTTCTAGG AACTAGAAA AGATGCCCCA
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5651 CTGACGCTCA GTGGAACGAA AACTCAGCTT AAGGGATTTC GGTCAATGAA
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5701 TTATCAAAA GGATCTTCAC CTAGATCCTT TTAATTAATA AATGAAGTTT
AATAGTTTTT CCTAGAGTG GATCTAGGAA AATTAAATTT TTACTTCAAA
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5751 TAAATCAATC TAAAGTATAT ATGAGTAAAC TTGGTCTGAC AGTTACCAAT
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5801 GCTTAATCAG TGAGGCACCT ATCTCAGCGA TCTGTCTATT TCCTCATCC
CGAATTAGTC ACTCCGTGGA TAGAGTCGCT AGACAGATAA AGCAAGTAGG
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5851 ATAGTTGCTT CACTCCGCGG GGGGGGGGCG CTGAGGTCTG CCTCGTGAAG
TATCAACGGA CTGAGGCCCC CCCCCCCCCG GACTCCAGAC GGAGCACTTC
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5901 AAGGTGTTGC TGACTCATAC CAGGCCTGAA TCGCCCATC ATCCAGCCAG
TTCCACAACG ACTGAGTATG GTCCGGACTT AGCGGGCTAG TAGCTCGGTC
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5951 AAGTGAGGG AGCCACGGTT GATGAGAGCT TTGTTGTAGG TGCACCAATT
TTCACTCCC TCGGTGCCAA CTACTCTCGA AACAACATCC ACCTGGTCAA
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6001 GGTGATTTTC AACTTTTGCT TTGCCACGA ACCGTCTCGG TTGTCGGGAA
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6051 GATGCTGAT CTGATCCTTC AACTCAGCAA AAGTTGGAAT TATTCAACAA
CTACGCACTA GACTAGGAAC TTGAGTCCTT TTCAAGCTAA ATAAGTTGTT
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6101 AGCCGCGGTC CCGTCAAGTC AGCGTAATGC TCTGCCAGTG TTACAACCA
TCGGCCGACG CGCAGTTGAG TCGCATIACG AGACGGTCAC AATGTTGCTT
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6151 TTAACCAAT CTGATTAGAA AAATCATCG AGCATCAAT GAACTGCAA
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6201 TTTATTGATA TCAGGATTAT CAATACCATA TTTTGA AAAA AGCCGTTTCT
AAATAAGTAT AGTCTAATA GTTATGGTAT AAAAATTTT TCAGCAAGA
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6251 GTAATGAAGG AGAAACTCA CCGAGGCACT TCCATAGGAT GCCAAGATCC
CACTACTTCC TCTTTTGAAT GGCTCCCTCA AGGTATCCTA CCGTCTTAGG

6301 TGGTATCGGT CTGCGATTCC GACTCGTCCA ACATCAATAC AACCTATTAA
ACCATAGCCA GACGCTAAGG CTGACCAGGT TGTAGTTATG TTGGATAATT

6351 TTTCCTCTCG TCAAAAATAA GGTATCAAG TGAGAAATCA CCATGAGTGA
AAAGGGGAGC AGTTTTTATT CCAATAGTTC ACTCTTTAGT GGTACTCACT

HindIII

6401 CGACTGAATC CGGTGACAAT GGCAAAAGCT TATGCATTTC TTCCAGACT
GCTCACTTAC GCCACTCTTA CCOTTTTCGA ATACGTAAAG AAAGGTCTGA

6451 TGTTCACACG GCCAGCCATT ACGCTCGTCA TCAAAATCAC TCGCATCAAC
ACAAGTTGTC CGSTCGGTA TCGAGCACT AGTTTATAGT AGCGTAGTTG

PvuI

6501 CAAACCGCTA TTCATTCTGT ATTCGCGCTG AGCGACACGA AATACGCGAT
GTTTGCAAT AAGTAAGCAC TAACCCGAC TCGCTCTGCT TTATGCGCTA

PvuI

6551 CGCTGTATAA AGGACAATTA CAAACAGGAA TCGAATGCAA CCGGCGCAGG
CCGACAATTT TCCTGTAAAT GTTTGTCTT AGCTTACGTT GCGCGCTCC

6601 AACACTGCCA GCGCATCAAC AATATTTTCA CCTGAATCAG GATACTCTTC
TTGTACGGT CCGGTAGTTG TTATAAAGT GCACTTAGTC CTATAAGAAG

6651 TAATACCTGG AATGCTGTT TCCCGGGGAT CGCACTGGTG AGTAACCATG
ATTATGGACC TTACGACAAA AGGGCCCCCTA GCGTCACCAC TCATTGGTAC

6701 CATCATCAGG AGTACGGATA AAATGCTTGA TCGTCGGAAG AGGCATAAAT
GTAGTAGTCC TCATGCCTAT TTTACGAAT ACCAGCCTTC TCCGTATTTA

6751 TCCGTCAGCC AGTTTATGCT GACCATCTCA TCTGTAACAT CATTGGCAAC
AGGCAGTGG TCAAAATCAGA CTGGTAGAGT AGACATTGTA GTAACCGTTG

6801 CCTACCTTTG CCAATGTTCA GAAACAACCC TGGCGCATCG GCGTTCCCAT
CGATGGAAAC GGTACAAAGT CTTTGTGAG ACCGCGTAGC CCGAAGGCTA

6851 ACAATCGATA GATTCTCGCA CCTGATTGCC CGACATTATC CCGAGCCCAT
TGTTAGCTAT CTAACAGCGT GGACTAACGG GCTGTAATAG CGCTCGGTA

XhoI

6901 TTATACCCAT ATAAATCAGC ATCCATGTTG GAATTTAATC CGGCGCTCCA
AATATGGGTA TATTTAGTGG TAGGTACAAC CTTAAATTAG CGCGCGAGCT

XhoI

6951 GCAAGACGTT TCCCGTTCAA TATGGCTCAT AACACCCCTT GTATTACTGT
CGTTCTGCAA AGGGCAACTT ATACCGAGTA TTGTGGGCAA CACAAATGCA

7001 TTATGTAAGC AGACAGTTT ATTGTTTCAT ATGATAATTT TTTATCTTGT
AATACATTGG TCTGTCAAAA TAACAAGTAC TACTATATTA AAATAGAACA

DraIII

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7051 GCAATGTAAC ATCAGAGATT TTGAGACACA ACGTGGCTTT CCCCCCCCCC
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7101 CCATTATTGA AGCATTATC AGCGTATTG TCTCATGAGC GGATACATAT
      GGTAACTAACT TCGTAAATAG TCCCAATAC AGAGTACTCC CCTATGTATA
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7151 TTGAATGTAT TTAGAAAAAT AAACAAATAG GGGTTCCGCG CACATTTCCT
      AACTTACATA AATCTTTTTA TTTGTTTATC CCCAAGGCGC GTGTAAAGGG
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7201 CGAAAAGTGC CACCTGACGT CTAAGAAACC ATTATTATCA TGACATTAAC
      GCTTTTCACG GTGGACTGCA GATTCCTTGG TAATAATAGT ACTGTAATTG
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7251 CTATAAAAAI AGGCGTATCA CGAGGCCCTT TCGTC
      GATATTTTTA TCCGCATAGT CCTCCGGGAA ACCAG
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09600766-051401

pVR 1012-SCP (2)

General Description

DSA pVR 1012-SCP (2)
 Local object
 Created: 09/14/98 04:29PM
 Last Modified: 09/15/98 04:50PM
 length: 7272 bp
 storage type: Basic
 form: Circular

Comments

Restriction Map

DraIII: 1 site CACNNGGTG
 GTGNNACAC
 HindIII: 1 site AAGCTT
 TTGGA
 HpaI: 1 site GTTAAC
 CAATTG
 KpnI: 1 site GGTACC
 CCTGG
 NotI: 1 site GCGGCCGC
 CGCCGGCG
 PmlI: 1 site CACGTC
 GTGCAC
 PvuI: 1 site CGATCG
 GGTAGC
 SacII: 1 site CCGCGG
 GCGGCC
 XbaI: 1 site TCTAGA
 AGATCT
 XhoI: 1 site CTCGAG
 GAGCTC
 EcoRV: 2 sites GATATC
 CTATAG
 NcoI: 2 sites CCATGG
 GGTACC
 NdeI: 2 sites CATATG
 GTATAC
 SphI: 2 sites GCATCG
 CCTACG

Functional Map

CDS (4 signals)

CMV IE 5' UT

Start: 886 End: 1129

CMV IE INT

Start: 1130 End: 1840

TbGH

Start: 4289 End: 4841

Kanr

Start: 6337 End: 6959 (Complementary)

Misc_feature (2 signals)

09600766-054401

CMV enhancer

Start: 248 End: 885

SGP(Z)

Start: 1870 End: 4288

Annotati ns

09600768.051401

1 TCGCGCGTTT CGGTGATGAC GGTGAAAACC TCTGACACAT GCAGCTCCCG
 ACGCGCGAAA GCGACTACTG CCACTTTTGG AAGCTGTGTA CGTCGAGGGC

 31 GAGACGGTCA CAGCTTGTCT GTAAAGCGGAT CCGGGGACCA GACAAGCCCG
 CTCGTCCAGT GTCGAACAGA CATTCGCCTA CCGCCCTCGT CTGTTGGGGC

 101 TCAGGCGCGG TCAGCGGGTG TTGGCGGGTG TCGGGCGTGG CTTAACTATG
 AGTCCCGCGG AGTCGCCCCAC AACCGCCCCAC ACCCCCGACC GAATTGATAC

NdeI

151 CGGCATCAGA GCAGATTGTA CTGAGAGTGC ACCATATGCG GTGTGAAATA
 GCGGTAGTCT CGTCTAACAT GACTCTCAGC TGGTATACGC CACACTTTAT

 201 CCGCACAGAT GCGTAAGGAG AAAATACCGC ATCAGATTGG CTATTGCCCA
 GCGGTGTCTA CGCATTCCCTC TTTTATGGCG TAGTCTAACG GATAACCGGT

 251 TTGCATACGT TGTATCCATA TCATAAZATG TACATTTATA TTGGCTCATG
 AACGTATGCA ACATAGGTAT ACTATTATAC ATGTAAATAT AACCGAGTAC

 301 TCCAACATTA CCGCCATGTT GACATTGATT ATTGACTAGT TATTAATAGT
 AGGTTGTAAAT GCGCGTACAA CTGTAACTAA TAACTGATCA ATAATTATCA

 351 AATCAATTAC GGGGTCATTA GTTCATAGCC CATATATGCA GTTCCGCGTT
 TTAGTTAATG CCCCACTAAT CAAGTATCGG GTATATACCT CAAGCGCGAA

 401 ACATAACTTA CCGTAATGCG CCCGCGTGGC TGACCGCCCA ACGACCCCGG
 TGTATTGAAT GCCATTTACC GCGCGGACCG ACTGGCGCGT TCGTGGGGGC

 451 CCCATTGACG TCAATAATGA CGTATGTTC CATAGTAACG CCAATAGGGA
 GGGTAACTGC AGTTATTACT GCATACACCG GTATCATTGC GGTATCCCT

 501 CTTTCCATTG ACGTCAATGG GTGGAGTATT TACGGTAAAC TGCCCACTTG
 GAAAGGTAAC TGCAGTTACC CACCTCATAA ATGCCATTTC ACGGGTGAAC

NdeI

551 GCAGTACATC AAGTGTATCA TATGCCAAGT ACGCCCCCTA TTGACGTCAA
 CGTCATGTAG TTCACATAGT ATACCGTTC A TCGGGGGGAT AACTGCAGTT

 601 TGACGGTAAA TGGCCCCGCT GGCATTATGC CCAGTACATG ACCTTATGGG
 ACTGCCATTT ACCGGGCGGA CCGTAATACG GGTCAATGAC TCGAATACCC

NcoI

651 ACTTTCCTAC TTGGCACTAC ATCTACGTAT TAGTCATCGC TATTACCATG
 TCAAGCATG AACCGTCATG TAGATGCATA ATCAGTAGCG ATAATGGTAC

NcoI

701 GTGATCGCGT TTGGCAGTA CATCAATGGG CGTGGATAGC GGTTCGACTC
 CACTACGCCA AAACCGTCAT GTAGTTACCC GCACCTATCG CCAAACTGAG

 751 ACGGGGATTT CCAAGTCTCC ACCCCATTGA CGTCAATGGG AGTTTCTTTT
 TGGCCCTAAA GGTTCAGAGG TGGGGTAACT GCAGTTACCC TCAAAACAAA

 801 GGCACCAAAA TCAACGGGAC TTTCCAAAAT GTCGTAAACA CTCGCCCCCA
 CCGTGGTTTT AGTTGCCCTG AAAGGTTTTA CAGCATTTGT GAGGCGGGGT

651 TTGACGCAAA TGGGCGGTAG GCGTGTACGG TGGGAGGTCT ATATAAGCAO
AACTGCGTTT ACCCGCCATC CGCACATGCC ACCCTCCAGA TATATTCGTG

901 AGCTCGTTTA GTGAACCGTC AGATCGCCTG GAGACGCCAT CCACGCTGTT
TCGAGCAAAAT CACTTGCCAG TCTAGCCGAC CTCTCCGCTA GTTCCGACAA

SacII

951 TTGACCTCCA TAGAAGACAC CGGGACCGAT CCAGCTCCG CGGCGGGGAA
AACTGGAGGT ATCTTCTGTG GCCCTGGCTA GGTCCGAGGC GCCGSCCTT

1001 CGGTGCATTG GAACCCCGAT TCCCCGTGCC AAGAGTGACG TAAGTACCGC
GCCACGTAAC CTTCGCCCTA AGGGGCACGG TTCTCACTGC ATTCATGGCG

SphI

1051 CTATAGACTC TATAGCCACA CCCCTTTGGC TCTTATCCAT GCTATACTGT
GATATCTGAG ATATCCGTGT GGGGAACCG AGAATACGTA CGATATGACA

1101 TTTTGGCTTG GGGCCTATAC ACCCCCGCTT CCTTATGCTA TAGGTGATGG
AAAACCGAAC CCCGATATG TGGGGGCGAA GGAATACGAT ATCCACTACC

1151 TATAGCTTAG CCTATAGGTG TGGGTTATTC ACCATTATTG ACCACTCCCC
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1201 TATTGGTGAC GATACTTTCC ATTACTAATC CATAACATGG CTCTTTGCCA
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1251 CAACTATCTC TATTGGCTAT ATGCCAATAC TCTGTCTCTC AGAGACTGAC
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1301 ACGGACTCTG TATTTTACA GGATGGGGTC CCATTTAATA TTIACAAAT
TGCCCGAGAC ATAAAAATGT CCTACCCGAG GGTAAATAAT AATGTTTAA

1351 CACATATACA ACAACCCGCT CCCCCGTGCC CGCAGTTTAT ATTAACATA
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1401 CGGTGGGATC TCCACGGGAA TCTCGGCTAC GTGTTCGGGA CATGGGCTCT
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1451 TCTCCGCTAG CGCGGGAGCT TCCACATCCG AGCCCTGGTC CCATGCCTCC
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1501 AGCGGCTCAT GGTCCGCTCG CAGCTCCTTG CTCCTAACAG TGGAGGCCAG
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1551 ACTTAGCCAC AGCACAATCC CCACCACCAC CAGTGTGCCG CACAAGGCCG
TGAATCCGTG TCGTGTACG GGTGGTGGTG GTCACAGGC GTGTCCGGC

1601 TCGCGGTAGG GTATGTGTCT GAAATGAGC GTGGAGATG GGTCCGACG
ACCGCATCC CATACACACA CTTTACTCG CACCTCTAAC CCGAGCGTGC

1651 GCTGACGCAC ATGGAAGACT TAAGGCAGCG GCAGAGAGG ATCCAGGCAG
CGACTGCGTC TACCTCTGA ATTCCGTCCG CGTCTTCTTC TACGTCCGTC

1701 CTGAGTGTCT GTATTCTGAT AAGAGTCAGA GGTAACTCCC GTTGGGGTGC
GACTCAACAA CATAAGCTA TTCTCACTCT CCATTGAGGG CAACGCCAGC

051401

NpaI

1751 TGTAAACGGT GGAGGGCACT GTAGTCTGAG CAGTACTCGT TGCTGCCCGG
ACAATTGCCA CCTCCCGTCA CATCAGACTC GTCATGAGCA ACGACGGCGC

NcoI

1801 CCGCCACCA GACATAATAG CTGACAGACT AACAGACTGT TCCTTTCCAT
CGCGGGTGGT CCGTATTATC GACTGTCTGA TTCTCTGACA AGGAAAGGTA

NcoIPstIEcoRVNotI

1851 GGGTCTTTTC TGCATCACC GTCCTCGACA CGTCTGATCA CATATCCCGG
CCCAGAAAG ACCTCAGTGG CAGCAGCTGT GCACACTAGT CTATAGCGCC

NotI XbaI

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GGCGAGATCT GGTCCGCGGA CCTAGCTTAA CTACTTCTAA TTCGGCTGTC

1951 TGAGCGTAAT CTTCACTCTCT CTTAGATTAT TTGTTTCCA GAGTAGGGGT
ACTCGCATTA GAAGTAGAGA GAATCTAATA AACAAAAGGT CTCATCCCA

2001 CCGCAGGTC TTTCAATCG TGTAACAAA ATAACTCCA CTAGAAGGAT
CCAGTCCAGG AAAAGTTAGC ACATTGGTTT TATTTGAGGT GATCTTCTA

2051 ATTGTGGGSC AACACACAA TGGGCGTTAC AGGAATATTG CAGTTACCTC
TACACCCCG TTGTTGTGTT ACCCGCAATG TCCTTATAAC GTCAATGGAG

2101 GTGATCGATT CAGGAGGACA TCATTCTTTC TTTGGGTAAT TATCCTTTTC
CACTAGCTAA GTTCTCTGT AGTAAGAAAG AAACCCATTA ATAGGAAAG

2151 CAAAGACAT TTTCCATCCC ACTTGAGTC ATCCACAATA GCACATTACA
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2201 GGTACTGAT CTGACAAAC TAGTTTGTCTG TGACAAACTG TCATCCACAA
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2251 ATCAATTGAG ATCAGTTGGA CTGAATCTCG AAGGGAATGG AGTGGCACT
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2301 GACGTGCCAT CTGCAACTAA AAGATGGGCG TTCAGGTCCG GTGTCCACC
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2351 AAAGGTGGTC AATTATGAAG CTGGTGAATG GGCTGAAAAC TCCTACAATC
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2401 TTGAAATCAA AAAACCTGAC GCGAGTGAGT GTCTACCAGC AGCCCCAGAC
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2451 CGGATTCGGG GCTTCCCCCG GTGCCGTAT GTGCACAAAG TATCAGGAAC
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2501 GCGACCGTGT GCGGAGACT TTGCTTCCA TAAAGAGGGT GCTTTCTTCC
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2551 TGTATGATCG ACTTGCTTCC ACAGTTATCT ACCGAGGAAC CACTTTCGCT
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2601 CAAGGTGTCG TTGCATTCTT GATACTGCCC CAAGCTAAGA AGGACTTCTT
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2651 CAGCTCACAC CCCTTGAGAG AGCCGCTCAA TGCAACGGAG GACCCGTCTA
GTCCAGTGTG GGGAACTCTC TCGGCCAGTT ACCTTGCTCT CTGGGCAGAT

EcoRV

2701 GTGGCTACTA TTCTACCACA ATTAGATATC AGGCTACCGG TTTTGGAAAC
CACCAGATGAT AAGATGGTGT TAATCTATAG TCCGATGGCC AAAACCTTGG

2751 AATGACACAG ACTACTTGTG CGAGGTTGAC AATTTGACCT ACGTCCAACT
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2801 TGAATCAAGA TTCACACCAC AGTTTCTGCT CCAGCTGAAT GAGACAATAT
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2851 ATACAAGTGG GAAAGGAGC AATACCAAGG GAAACTAAT TTGGAAGGTC
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2901 AACCCTGAAA TTGATACAAC AATCGGGGAG TGGGCTTCT GGGAACTAA
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2951 AATAACCTCA CTAGAAAAAT TCGCAGTGAA GAGTGTCTT TCACAGTTGT
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3001 ATCAAACGGA GCCAAAAACA TCAGTGTCTA GAGTCCGGCG CGAACTTCTT
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3051 CCGATCCAGG GACCAACACA ACAACTGAAG ACCACAAAAT CATGGCTTCA
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3101 GAAATTCCT CTGCAATGGT TCAAGTGCAC AGTCAAGGAA GGAAGCTGC
CTTTTAAGGA GACGTACCA AGTTCACGTG TCAGTTCCTT CCCTTCGAGC

3151 AGTGTCCGAT CTAACACCC TTCCACAAAT CTCCACGAGT CCCCATCCC
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3201 TCACAACCAA ACCAGGTCCG GACAACAGCA CCCATAATAC ACCCGTGTAT
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3251 AACTTGACA TCTCTGAGGC AACTCAAGTT GAACAACATC ACCGCAGAAC
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3301 AGACACACAC AGCAGAGCCT CCGACACTCC CTCTGCCAGG ACCCGAGCCG
TCTGTGCTG TCGTGTCCGA GCTGTGAGG GAGACGGTGC TGGCGTCGGC

3351 GACCCCCAAA AGCAGAGAAC ACCAACAGCA GCAAGAGCAC TCACTTCTCT
CTGGGGGTTT TCGTCTCTTG TGGTGTGCT CGTTCTCTG ACTGAAGGAC

3401 GACCCCGCCA CCACAACAG TCCCAAAAC CACAGCGAGA CCGCTGGCAA
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3451 CAACAACACT CATCAACAG ATACCGGAGA AGAGAAGGCC AGCAGCGGGA
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3501 AGCTAGGCTT AATTACCAAT ACTATTGCTG GAGTCGCAGG ACTGATCACA
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 3551 GCGCGGAGAA GAACTCGAAG AGAAGCAATT GTCAATGCTC AACCCAAATG
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 3601 CAACCTTAAT TTACATTACT GGACTIONCA GGATGAACGT GCTCCAATCG
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 3651 GACTGCGCTG GATACCATAT TTCGGGCCAG CAGCCGAGGG AATTACATA
 CTGACCGGAC CTATGOTATA AAGCCCGGTC CTCGGCTCCC TTAATGTAT

 3701 GAGCGGCTAA TGCACAATCA AGATGGTTA ATCTGTGGGT TGACACAGCT
 CTCGCCGATT ACGTGTAGT TCTACCAAT TAGACACCA ACTCTGTGGA

 3751 GCGCAACGAG ACGACTCAAG CTCTCAACT GTTCTGAGA GCCACAACCTG
 CCGGTTCTCT TCCTGAGTTC GAGAAGTTGA CAAGGACTCT CCGTGTGAC

 3801 AACTACGAC CTTTCAATC CTCAACCGTA AGGCAATTGA TTTCTGCTG
 TCGATCCGTG GAAAAGTTAG GAGTTGGCAT TCCGTTAACT AAAGAAGCAC

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SphI

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RpnI

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HindIII

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XhoI

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DraIII

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